

AUTOMOTIVE INDUSTRIES

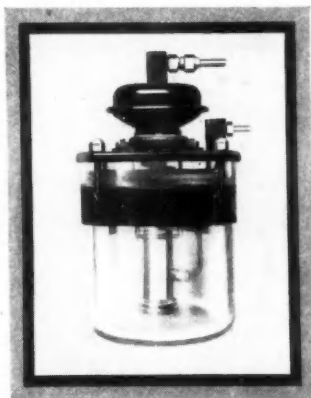
LAND AIR WATER

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AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

Vol. 64

Reg. U. S. Pat. Off.
Established 1902

No. 2

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Automotive Industries

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January 10, 1931

Automotive Industries

AUTOMOTIVE INDUSTRIES

VOLUME 64

JANUARY 10, 1931

NUMBER 2

Lower Price Trend at New York Show Suggests Widespread Sales Efforts



by Leslie Peat

THE 1931 automobile show season opened auspiciously Saturday afternoon when an unusually large attendance surged into Grand Central Palace, New York, to see the 300 or more new models of 36 automobile manufacturers. The New York show was open on Sunday this year for the first time.

Because there were fewer exhibitors this year than during previous shows, manufacturers were able to put on better exhibits. The many body models offered by most makers in the industry gave the public an opportunity to see some of the style innovations which marked this year's showing.

Manufacturers seem to have realized that lower prices will bring people into the new car market

again. There has been a general downward revision. Lower raw material prices and some manufacturing economies have abetted this lowering of prices. There has been no evidence of reduced value in cars, however.

Comments about the prevailing low prices were common during the opening days of the show. But cars have more eye appeal, they are larger and many have more horsepower than those their manufacturers produced in past years.

A feeling of restrained optimism prevailed in hotel lobbies as manufacturers discussed the 1931 outlook. Last year a number of executives expressed high confidence that 1930 would see a sharp recovery from the depression which rolled up in dark cloud formations.

The cataclysm of November, 1929, was seen as a passing incident by many manufacturers. This year that same slump, viewed from a distance of 365 days, looks more like a somewhat normal cyclic occurrence in the financial and industrial history of the nation and the world.

Manufacturers are content to await the recovery instead of making heavy parts and raw material com-

mitments at this time. Reduced prices of cars, a number believe, will stimulate retail sales sufficiently to accelerate better times in the industry.

Factory executives are not making the optimistic predictions for 1931 many of them made for 1930, but seem to have turned their attention more to producing automobiles that will sell.

Car companies are apparently picking new dealerships with more care than heretofore. Manufacturers who are offering strikingly more automobile for the money are, of course, in a position to be more cautious in selecting dealers and can demand more of prospective dealers in the way of financial stability, business acumen and standing in their own respective communities.

Conversely, dealers will have more chance to survive the admittedly tough year ahead if they are forearmed with greater financial assets and more business acumen.

Reduction of slow-selling body models and the rumored elimination of non-profitable lines on the part of several companies will go far to strengthen dealers' positions in 1931.

Markets for 500,000 More Passenger Cars and 90,000 More Trucks Are Expected During 1931 Over 1930

1930 Estimated Total Motor Vehicle Production United States and Canada 4,075,000

PASSENGER CARS		1930	TRUCKS		1930
Est. United States and Canadian Production		2,917,000	Est. United States and Canadian Production		564,000
Est. Canadian Production		124,000	Est. Canadian Production		30,000
Est. United States Production		2,793,000	Est. United States Production		534,000
Est. United States Domestic Sales		2,703,000	Est. United States Domestic Sales		412,000
		90,000			122,000
Est. U. S. Exports and Foreign Assemblies		242,000	Est. U. S. Exports and Foreign Assemblies		160,000
Decrease in Dealer Stocks		152,000	(See Footnote)		*38,000

1931 Estimated Total Motor Vehicle Production United States and Canada 3,481,000

PASSENGER CARS		1931	TRUCKS		1931
Est. United States and Canadian Production		3,425,000	Est. United States and Canadian Production		650,000
Est. Canadian Production		135,000	Est. Canadian Production		35,000
Est. United States Production		3,290,000	Est. United States Production		615,000
Est. United States Domestic Sales to Dealers		3,040,000	Est. United States Domestic Sales to Dealers		480,000
Est. U. S. Exports and Foreign Assemblies		250,000	Est. U. S. Exports and Foreign Assemblies		165,000
			(See Footnote)		*30,000

Obviously, all of the above figures are purely estimates. In compiling them the hope has been to have them correct within plus or minus 5 per cent. Some of them are admittedly open to dispute statistically, but they represent a careful consideration of all the data relating both to general business conditions and to past automotive performance specifically. They are recorded thus definitely merely in the hope of conveying a general idea of the outlook quickly, and in no sense as being an accurate quantitative representation.

*Each year many vehicles sold are registered as new trucks, although reported as passenger car production by the factories which build them. In this category are such vehicles as salesmen's cars and light commercial jobs on passenger car chassis. This results in a statistical discrepancy which the estimates indicated by asterisks approximate.

Just Among Ourselves at the New York Show

The Prognosticators Ran Short on Production

THE industry isn't suffering from over-prediction this year. An outstanding feature of the opening days of the New York show was the reticence of factory officials to prognosticate. Never in the history of the industry has there been such a lack of specific guessing. President Erskine of Studebaker was about the only important exception to the general rule. He set 100,000 cars as the Studebaker sales goal for 1931, as against 64,000 last year.

And Guesses Were Taboo

MOST other executives were loath to be quoted—or to make any definite guesses anyhow. We saw such men as Roy Faulkner and Neil McDarby, of Auburn; Rufus Cole, of Hupmobile; John E. Williams, of Franklin; W. S. Knudsen, of Chevrolet, and a number of others on the opening day while other Chilton editorial men contacted several score more. But nobody was tossing about futuristic statistics with anything like the abandon of former years.

Sales—The Pacemaker for the Production Line

FOR the first quarter a majority of companies are going to shoot for a total output equal to that of the first quarter of last year. The industry's total then was 910,351 passenger cars and 159,942 trucks.

Certainly there is no indication that production is to be

stepped up without being definitely correlated with retail sales trends, although the natural tendency exists on the part of most executives to feel that their own sales will improve a bit faster than their competitors'. That's just the enthusiasm and drive which make this old automotive world of ours go round. Generally speaking, however, no immediate danger of overproduction exists.

Some Told Their Story and Some Showed It

THE show this year was the most richly and cosily decorated exhibit we have attended. Some of the exhibitors still need more space to exhibit full lines adequately, but in general, it seemed to us, the visibility was higher than in the past.

Stripped chassis vocally described by lecturers again drew the big crowds and made adjoining booths look sparsely populated, especially when accompanied by some new feature about which public curiosity already had been aroused by advertising.

In at least one case, however, a display of an entirely new line attracted heavy crowds throughout the opening day without any lecture feature and without being on the first floor.

Wet and Warm in the Accessory Exhibits

THE opening day was enlivened by a fire which got under way among some packing cases on the fifth floor of the palace just above the fourth floor accessory exhibits. Quick

and free use of water by firemen soon inundated the blaze and a little later a number of accessory displays on the floor below. The chief sufferer from the latter, so far as we could make out, was John Bean Mfg. Co.

And Discounts Were Discussed

DISCOUNT discussions between distributors, dealers and factory men were numerous this year, but few important discount changes seem to have been recorded as the 1931 selling season starts. Such changes as have been made indicate a slight downward trend, although increases have been recorded in one or two specific instances. General f.o.b. price levels, of course, have gone down, making the number of dollars less with which dealers and distributors have to work.

Up 'n' At'em Before Chow

A PRE-BREAKFAST visitor to the car displays in the Commodore lobby on Saturday morning was Alfred Reeves, N. A. C. C.'s famous g.m. Mr. Reeves expressed considerable enthusiasm about the big pre-show dinner of the New York Automobile Merchants Association, which constituted the opening gun of show activities on Friday evening. Going into what must be his thirtieth or thirty-first automobile show, Mr. Reeves was astir and eagerly alert long before most other show visitors from the industry had even started to shave.

Good Morning From Auburn

MORNING *Herald Tribunes* at the Commodore on Saturday and following days were "by courtesy of Auburn Automobile Co." The "Good morning" slip called attention to the Auburn and Cord displays in the Commodore lobby as well as at the show itself.—N.G.S.

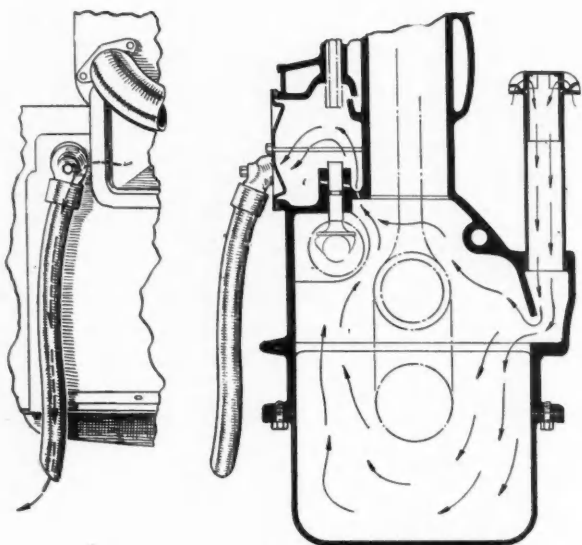


Diagram of crankcase ventilating system
on Chrysler Eight + + + + +

Engineering New York Show

More than a dozen makers
have adopted transmissions
with silent intermediate speeds

IN one way 1931 will mark a departure in automobile engineering: The center of attack on design problems has shifted from the engine to the transmission. Most of the developments in engines reflected by the new chassis are of a minor nature, but the widespread adoption of transmissions with silent high and intermediate speeds and with either the gear-synchronizing or the free-wheeling feature, or both, is of a more fundamental character. It would now seem that the ordinary three-speed sliding gear transmission with plain spur gears, which three years ago was about the most nearly standardized component of the whole car, was doomed.

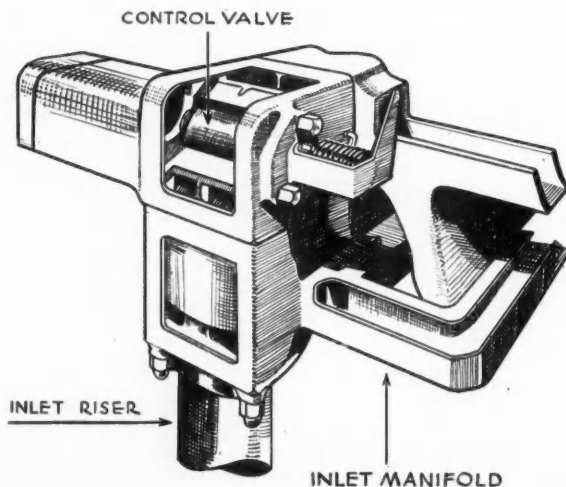
More than a dozen makes of passenger cars this year will carry transmissions with silent intermediate speeds. Some of these, as well as others with transmissions of the plain spur-gear type, will have the "easy-shift" feature by which the intermediate as well as the high speed is engaged by means of jaw clutches, the two members of the clutch, before being positively engaged, being brought to the same speed of rotation by means of friction members. Others will be fitted with a free-wheeling device, of which latter two types are available, one embodying the principle of the roller ratchet and the other that of the coil clutch.

The type of silent transmission with internal gears, while not entirely out of the picture, has certainly lost ground. It served the purpose of showing that automobile transmissions can be built commercially which will carry the load on the geared speeds without objectionable noise. The substitution of helical and herringbone for internal gears has simplified the silent

transmission and cut its cost of production, and the end thrust which must be taken care of where helical gears are used does not seem to have given rise to any serious difficulty.

Taking the 1931 offerings as a whole, it seems to be still the consensus of opinion of those who guide the destinies of the various companies that the American buying public wants cars bigger and more powerful. Not only has there been considerable development in multi-cylindered cars at the upper end of the price scale, in which field several further announcements are due in the spring, but increases in wheelbase and in cylinder bore have been quite common among the lower-priced models. The eight-cylinder in-line type of engine has gained considerable territory, with such prominent concerns as Buick and Chrysler, among others, having switched from the six to the eight in the course of the year. Price reductions have been general, and in some cases it has been sought to obviate the need for drastic cuts by enlarging the cars or by furnishing additional equipment.

Two interesting new engines of the year are the Cadillac 12 and the Marmon 16, both of the V type, and it is noteworthy that both of these have angles of V



Sketch of the cut-away manifold and heat-control valve on the Graham-Paige

Developments in 1931 Models at Shift From Engines to Transmissions

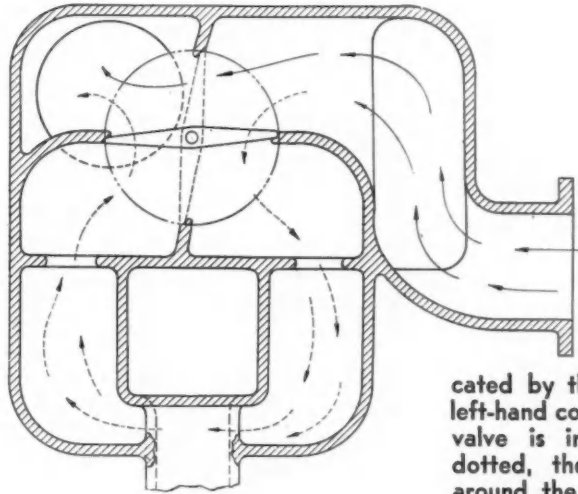
by

P. M. Heldt

which do not give an even sequence of explosions. It is true that with such large numbers of cylinders the slightly uneven spacings of exhausts cannot be noticed by the ear; also, the dynamic balance is not affected, since the moving parts of each bank of cylinders are completely balanced, but the comparative evenness of the torque curve, which is one of the chief advantages of multi-cylinder construction, must be somewhat adversely affected. Reasons given for the adoption of the unconventional angles of V are that it makes for convenience in manufacture and that with non-uniform sequence of explosion there is less trouble from torsional vibration.

Engine speeds are still creeping up, and peaking speeds of 3200 and 3400 r.p.m. are common. This has led to increased attention to the problems which have their origin in high speeds. Several manufacturers, for instance, have placed additional ribs on their crankcases. Formerly a wide flange along the lower edge of the crankcase, some inches below the crankshaft axis, was considered sufficient to assure all the necessary rigidity, but now an additional rib is run along the length of the crankcase at the level of the crankshaft axis, and is connected to the bottom flange by vertical ribs at intervals. Instead of placing this rib on the outside of the case, at least one manufacturer has it on the inside, no doubt because the smoother the outside of the engine block, the easier it is to keep clean. Flywheel housings in some cases also have been stiffened by ribbing. Aside from the resulting reduction in noise and vibration, such stiffening of the engine housings is desirable from the production standpoint, as it facilitates the maintenance of accuracy in the machining operations.

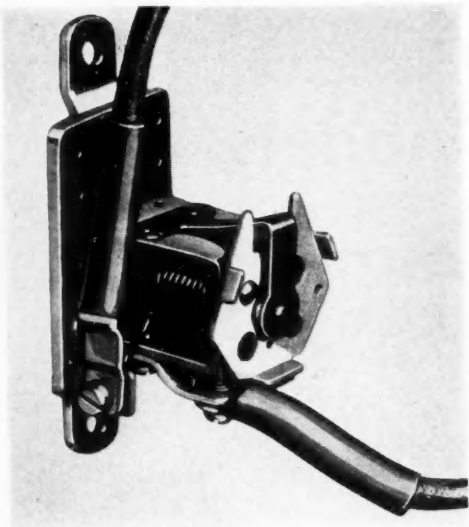
With the increase in cylinder numbers and engine speeds the need for torsional vibration dampers is becoming ever more urgent, and there have been some noteworthy developments in connection with such devices. There is a tendency, on the one hand, to utilize the work-absorbing capacity of rubber



Sectional sketch of the heat-control arrangement on the Graham-Paige. When the valve is closed, as shown, the gases from the exhaust manifold pass directly to the exhaust pipe, indicated by the circle in the upper left-hand corner, whereas when the valve is in the position shown dotted, the exhaust gases pass around the inlet header, as indicated by dotted arrows + +

when plastically deformed, rather than mechanical friction, for damping purposes, and, on the other, to make the damper effective for all of the critical speeds within the operating range of the engine. The ordinary friction-disk type of damper must be adjusted to take care of the highest critical speed within the operating range, and is then too "stiff" for the lower criticals. In the new Packard this problem is attacked by combining mechanical friction with plastic deformation of rubber members, while in a damper used by Studebaker the disks of the damper are forced together by pressures increasing with engine speed, these pressures being due to the centrifugal force on a number of steel balls. In several of the models of the Chrysler Corporation the damping action is due to the flexing of a sheet of rubber which is vulcanized to a flanged fitting on the crankshaft and to an inertia mass, while in the Franklin, rubberized fabric inserts in the clutch and in the impeller of the blower give a damping action.

Valve springs are another item that is adversely affected by increases in engine speeds, and steps have been taken by a number of manufacturers to combat spring surge. Studebaker fits a pressed steel member over the spring, which is in frictional contact with the central coils and damps any surge, while a number of other manufacturers use springs with non-uniform pitch, the pitch of the coils at the stationary end being smallest. These coils, in fact, close up completely when the spring is compressed. Surge consists of a wave motion passing



Automatic circuit breaker protecting electrical lines on Studebaker + + + + +

through the spring from end to end, and if the free motion of the coils at one end is prevented, surge cannot develop. Closing up of the coils near the stationary end, moreover, does not give rise to any unpleasant noise, owing to the low speed.

Crankcase ventilation has at least held its own, but in a number of instances where the crankcase was ventilated by engine suction this practice has been given up. The reason for this would seem to be a conviction that any products which it is desirable to remove from the crankcase because of their possible corrosive properties, should also be kept out of the cylinders. The increased oil consumption when there is a pipe connection from the crankcase directly to the carburetor inlet may have been another factor that prompted the change. It is now the common practice to have the valve chamber communicate with the crankcase and to lead a pipe from one end of the valve chamber into the airstream underneath the engine, as exemplified in the Chrysler system illustrated by one of the drawings herewith.

There has been no important change with regard to piston materials. All of the General Motors cars have pistons of ferrous materials (cast iron or semi-steel), while practically all others have aluminum alloy pistons, the majority of them with nickel-steel struts. One objection that has been raised against the conventional strutted piston is that the clearance is maintained only at the upper end of the skirt, where the struts are located. Graham-Paige has taken notice of this criticism and now uses double struts and splits the skirts over their whole length. The new Lo-Ex alloy of aluminum and silicon has come into use during the past year, but only to a limited extent. Pistons in the engines of several G.M. cars are now being tin-plated on the bearing surfaces, to assure their more rapid wearing in.

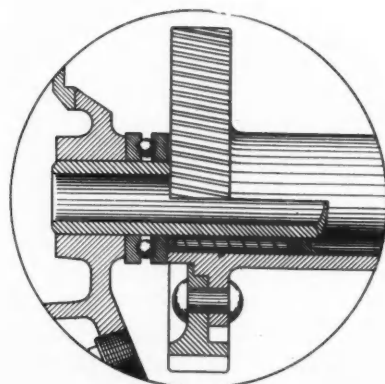
Connecting rods of light metal have made no further progress, but Nash has adopted aluminum-alloy connecting-rod caps. It is understood that aluminum alloy connecting rods have given some trouble in that when set up with a moderately close clearance at normal temperature, they are likely to grip the

crankpins tightly at extremely low temperatures and then make starting practically impossible. The combination of an aluminum-alloy rod with a steel cap or of a steel rod with an aluminum cap eliminates this difficulty, which is more likely to arise after the engine bearings have been serviced by mechanics unfamiliar with this construction than with the new engine, for Franklin's successful use of duralumin connecting rods over a period of years shows that the trouble is not inherent.

Most engines are very close to the "dead line" with respect to compression when using standard fuels. Although non-detonating or premium fuels are now available almost everywhere, manufacturers hesitate to put out engines designed for the exclusive use of such fuels, fearing evidently that the extra cost of the fuel might act as a sales resistance. It is probably safe to say, however, that compression ratios would not be as high as they are if it were not for the general availability of non-detonating fuels, for if trouble arises from detonation with ordinary fuels the owner always has at hand the remedy of a non-detonating brand. There has been further improvement in combustion chamber forms, and Marmon and Graham have revised their designs in this respect.

Carburetors have seen their share of development, as may be judged from the descriptions of several new models in these columns within the past several weeks. It cannot be denied that the carburetor is getting to be a rather complicated device, but this, apparently, cannot be avoided if all of the demands made upon it are to be satisfied. It must furnish a mixture of substantially uniform richness throughout an air speed range with limits of 1 to 20 or more; it must furnish a combustible mixture whether the air entering it is at zero or 100 deg.; it must furnish an economical mixture for normal conditions of operation, and a suitably enriched mixture for spurts.

Several more manufacturers have adopted the downdraft type of carburetor, which was introduced a year ago. The chief virtue of this carburetor seems to be that it is not dependent upon a high air speed to effect a tolerably uniform distribution, hence it is not necessary to use an inlet manifold of comparatively small cross section to assure satisfactory idling, and the amount of heat supplied to the inlet manifold also can be cut down. With larger inlet areas and less heat supply to the system, volumetric efficiencies can be better maintained at high speeds. Incidental advantages of the downdraft type are that it places the carburetor in a somewhat more

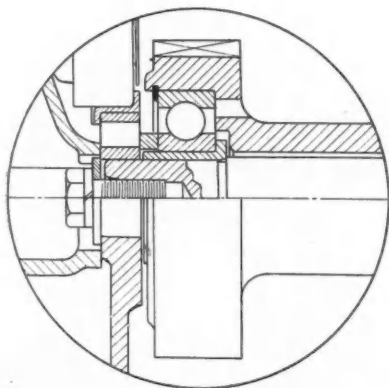


In the Lincoln transmission end thrust and radial loads on the secondary cluster gear are taken on separate anti-friction bearings

accessible position and that it gives an additional choice for the location of the exhaust "down-take"—at the center of the engine. The fact that the air inlet is high up under the hood would lead one to expect the air entering the system to be cleaner than when the inlet is low down at the side of the engine. There has been some trouble from flooding of cylinders on engines with downdraft carburetors due to excessive choking, and this may be one of the reasons for the new hook-up of the choke with the starter button and the throttle referred to farther along.

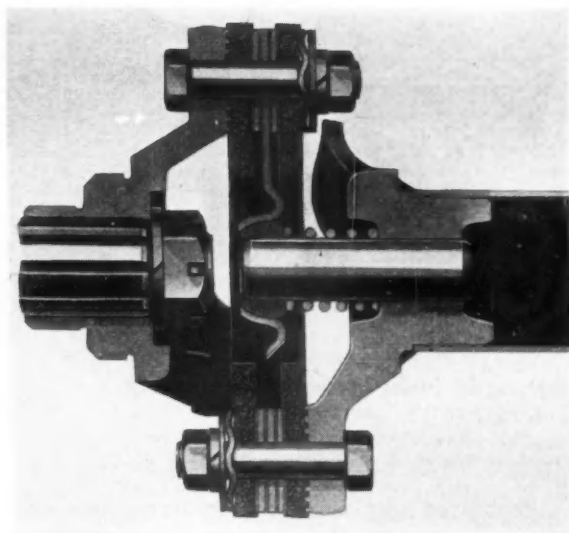
During the course of the past year one more distinctive type of engine noise—power roar—has been isolated and has had a remedy provided for it. The remedy consists in the application of a muffler or silencer to the intake. The roar seems to be due to the fact that at high speeds in multi-cylinder engines the frequency of the air pulsations in the intake system reaches the audible range. One of the silencers used is based on the principle of interference, the main pulsation being neutralized by an artificially induced auxiliary pulsation which differs from the former by half a wave length. Exhaust-type mufflers, however, based on the principle of reducing the pulsations in the rate of flow at the inlet, are also used for the purpose.

Fuel pumps are replacing the vacuum system more and more, and while they have overcome one difficulty, that of maintaining the feed when running "all out" for considerable periods, when there is little vacuum in the manifold, they have apparently aggravated another, that of vapor lock. There can be no doubt that the present run of trouble from vapor lock is due primarily to the very considerable lowering of the "10-per-cent" point of the average fuel during the past ten years, as brought out in the recently issued report on the semi-annual motor fuel survey of the Bureau of Mines. But the fuel pump under certain conditions develops a rather strong suction on the fuel line. This means low pressure on the fuel in the line, which is favorable to the formation of gas pockets. Quite a number of manufacturers have revised the fuel lines for their new models. Generally the main fuel line from the rear tank to the pump is carried in the frame side rail away from the exhaust pipe; in some cases the fuel pipe is lagged with heat-insulating material where it comes near the exhaust pipe, or it may be carried all around the engine at the front in order to keep it away from the exhaust pipe. On the Dodge provision is made to prevent vapor lock in the pump itself by placing a shield between it and the exhaust manifold above it.



All bearing loads at the forward end of the secondary gear cluster in the Pierce-Arrow transmission are taken on a large size annular ball bearing

Automotive Industries



Fabric-type universal joint with pressed-steel centering device on Oldsmobile

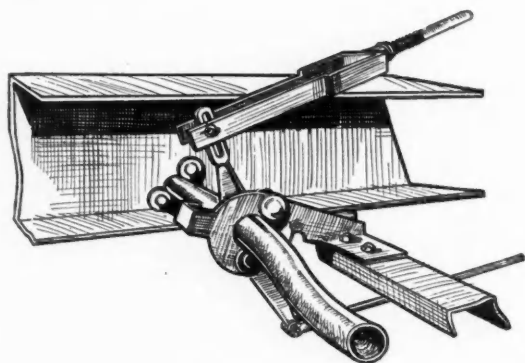
It is noteworthy that in the more recent eight-cylinder in-line engines with downdraft carburetors, single carburetors are used. Just previous to the advent of the downdraft carburetor it had become rather common to use dual carburetors for this type of engine. The object of the dual instrument was to help overcome distribution difficulties, and it would seem that with downdraft carburetion these are overcome to such an extent that the dual carburetor is not needed. Downdraft carburetion also may inaugurate a return from the exhaust-heated manifold-riser or standpipe to the simple hot-spot, for with this form of carburetion not so much heat is required to assure satisfactory distribution, and with a reduced heat supply as furnished by the hot-spot, the volumetric efficiency will be improved.

This leads us to the subject of heat supply and heat control, in connection with which there also has been a certain amount of development. Insufficient heat means poor idling, while excessive heat means a reduction in the maximum power, and the proportional amount of heat actually required varies considerably with the atmospheric temperature. Seasonal heat control and dash heat control are features with which we have been familiar for a considerable number of years. Automatic heat control is of more recent date, and appears in two forms. Several General Motors cars now have the supply of exhaust gases to the inlet jacket varied automatically by means of a weighted butterfly valve which is acted upon by the pressure in the exhaust manifold. When this pressure is low, most of the exhaust gases from this manifold are shunted around the valve through the jacket on the inlet header, whereas when the throttle is opened and the exhaust pressure rises beyond a certain value, the heat-control valve is opened thereby, and most of the exhaust gases escape directly without passing through the inlet jacket.

In the Pierce-Arrow the heat supply to the inlet manifold is controlled by means of a thermostat of the bimetallic type.

On a number of cars there is found a new hook-up of the controls for starting. When the starter button

January 10, 1931



Bracing of brake cross-shaft on Hudson

is depressed the choke is simultaneously and automatically closed, and the throttle slightly opened. This not only eliminates some of the manipulations that are ordinarily a part of the starting process, but automatically insures the best conditions for starting.

There is little new in cooling systems aside from dimensional changes. Fan-tip speeds have been cut down in some instances for the sake of noise reduction. Plymouth has forsaken the thermo-siphon system for the pump, and Franklin has been able to cut down greatly on the power consumption of the cooling blower. While the writer has not made a check of the matter by makes, it is his impression that the practice of combining the pump and fan into a single unit has reached its limit and may be even on the decline. It goes without saying that when the pump is to be set into the front of the cylinder block, pump design is somewhat hampered. Moreover, owing to continual changes in the front-end treatment, a fan on the end of the shaft of a pump set into the upper part of the cylinder block, in many cases would not occupy the proper position relative to the radiator. Of course, the practice of combining the fan and pump in a single unit was adopted in the first place mainly for the resulting simplicity in accessories drives. It may be that the necessity of cutting down on fan speeds has made it desirable to increase the speed of water circulation, which made it necessary to enlarge impeller diameters. Moreover, there is obviously a better chance for the continuation of water circulation by thermo-siphon action after the engine is shut down and in case of pump or pump-drive failure if the pump is located below the cylinder block.

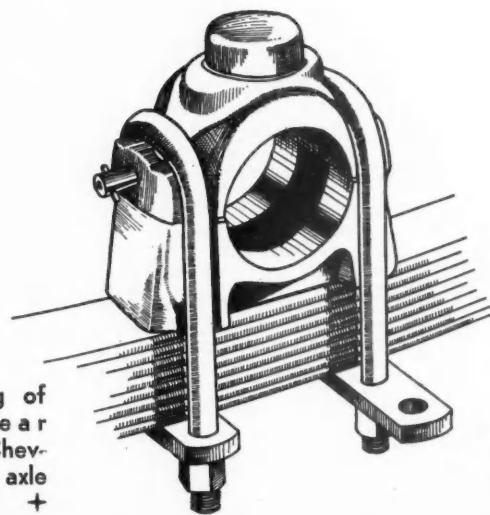
In connection with the subject of electrical equipment, attention may be called here to the recent introduction of a special metric spark plug with a thread diameter considerably smaller than that of the standard metric plug. Why this new plug was provided with a metric thread is not obvious on the surface, unless it be for the purpose of suggesting that it offers in an enhanced degree the advantages which led to the widespread adoption of metric plugs during the past two years. On the Graham cars is used a spark plug which was specially developed by the engineering staff of that company. By a change in the proportions at the inner or sparking end, the spread between the working conditions which with the standard spark plug result in pre-ignition and those which result in fouling of the plug, is said to have been greatly extended. More

cars—including the Studebakers—are now provided with a circuit breaker instead of the more conventional fuses in the electric distribution circuits. This circuit breaker (see illustration) when it opens as a result of a ground on the circuit protected by it, causes a buzzer to operate, thus giving an audible signal indicating the nature of the defect. Several manufacturers again have adopted the mechanical shift for the starter gears, the reason given for the change being that smaller pinions can be used with the mechanical shift and thus a larger gear reduction and greater starting torque on the engine crankshaft secured. Lincoln has changed from a single-unit to a two-unit electrical system, which must make the latter almost if not absolutely universal practice.

In connection with engine lubricating systems, oil cooling has received considerable attention. Hupp continues the oil cooler as part of the front radiator, and Buick has adopted a temperature regulator through which the engine oil and the cooling water flow at right angles to each other. Not only is the engine oil prevented from attaining excessive temperatures under severe operating conditions, but it is more rapidly brought up to normal working temperature when starting. The neat installation of this unit between the outlet of the water pump and the inlet to the jacket deserves commendation.

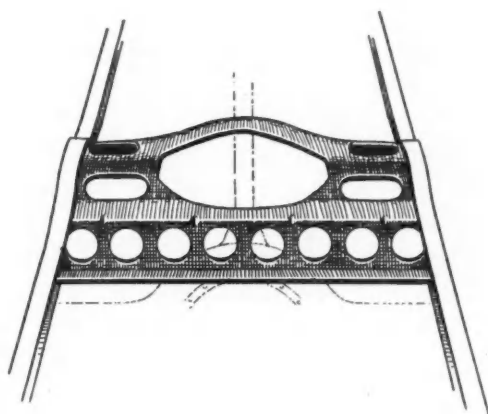
Other makers seek to keep the oil temperature within permissible limits by providing better cooling facilities on the crankcase. It may be pointed out in this connection that crankcase ventilation must tend to slightly lower the temperature of the oil in the case. European manufacturers, who use crankcases of light metal, habitually cast the lower half or sump with deep cooling fins, and in the case of the new Marmon Sixteen, which has an all-aluminum crankcase, there are fins on both the inside and the outside of the oil well. In pressed steel crankcases the cooling area can be similarly enlarged by corrugating the crankcase bottom, as in the Reo eight-cylinder engine.

With lubrication, as with carburetion, the greatest difficulties arise when the engine is operated at extremely low temperatures. In the lubricating system the strainers must be made of such fineness that they will not let pass any material that will do damage to the bearings if it gets into them, and yet the oil must pass through them at a sufficiently rapid rate when it is at a very low tempera-



Mounting of underslung rear springs of Chevrolet on rear axle housing + +

Frame cross-member
at rear kick-up on
Hudson car + +



ture and therefore extremely viscous. Some designers seem to have come to the conclusion that these conflicting conditions cannot be satisfactorily met, and they therefore provide means permitting the oil to by-pass the strainers under extreme conditions, or arrange the filters so that the oil on its way to the bearings does not have to pass through them. In one case a definite proportion of the oil moved by the pump is directed to the filter by means of a distributor valve formed by one of the camshaft bearings.

There is a growing tendency to do away with tubing and tube connections in engine lubricating systems and form all passages directly in the castings. Ordinarily the suction inlet to the oil pump is located at the very bottom of the oil well, so that the bearings will get oil even when there is very little left in the engine. The pump, of course, draws its oil through a strainer, and when the strainer is so close to the bottom of the well there is evidently more danger of its becoming clogged than if it were nearer the surface of the oil supply. Moreover, when the engine is started from cold, the oil circulates through the engine rather slowly, owing to its high viscosity, and what little does circulate accumulates at the surface of the supply in the crankcase. Hence if the pump inlet were near the surface of the supply, the period of scanty lubrication during a start from cold would be reduced. To make this possible without running the risk of starving the engine in case the supply in the crankcase runs low, Willys has adopted a floating oil intake bell.

There is little to report in connection with clutches, but the experience of the Willys engineering staff, that clutch shatter may be caused by an engine support insufficiently rigid in the longitudinal direction, is of interest. Now that there is a general tendency toward four-point support of the powerplant on rubber cushions or hangers, this problem of sufficient rigidity of the powerplant in the horizontal plane assumes considerable importance.

As pointed out in the introduction, the major changes in chassis design this year have been in connection with transmissions, but since all of the new transmissions have been illustrated and described in these columns in detail there remains little to say here. The end thrust due to the use of helical gears is usually taken on large-sized thrust disks at the ends of the secondary shaft, but in the Lincoln transmission it is taken up on regular ball thrust bearings at both ends of the secondary shaft, while in the Pierce-Arrow both end thrust and radial loads on the secondary gear cluster are taken up on a radial

ball bearing at the forward end. Both designs are illustrated herewith.

Final drive systems remain generally the same, but mention may be made here of a new universal joint of the familiar Spicer type with pressed-steel housing, with an effective oil seal. Heretofore this joint has employed grease lubrication. Metal universal joints are almost universally used, but the Oldsmobile has a fabric-type universal at the forward end of its propeller shaft. At one time, some fifteen years ago, the fabric joint seemed in a fair way to oust the metal joint, because it needs no lubrication and is silent in operation, but with the advent of high-speed engines its vogue ebbed off, because it was practically impossible to keep the driven shaft centered when connected to the driving shaft through fabric disks only. In the Oldsmobile application the driven shaft is held by means of a ball-and-socket support in such manner that the axes of the two shafts will always intersect and there will be no whirling of the forward end of the driven shaft (see illustration).

As regards rear axles, some improvements have been made looking toward more effective lubrication of the bearings in the central housing, and on the Oakland and one or two other cars the springs are now supported on the axle housings through rubber cushions, the latter, together with the rubber bushings in the spring shackles, giving double shock insulation of the chassis frame against the axles and wheels. On the Chevrolet, as on some other cars, the springs in the past were fastened to the saddle on the axle housing by U-bolts straddling the housing. With this arrangement there is naturally some risk of locking the saddle on the axle housing, which is undesirable when torque is to be taken on a torque tube. In the new Chevrolet, although U bolts are still used for securing the spring to the saddle, they are passed over shoulders formed on the saddle, as shown in the illustration.

Special parking brakes seem to be disappearing where mechanical four-wheel brakes are standard equipment, even some of the highest-priced lines now having only the four-wheel brakes. To meet the requirements of motor vehicle administrators, the brake linkages must be so designed that any breakage that may occur anywhere on the system will leave at least two of the brakes effective. This presupposes sturdy support for the cross shaft, and several braking systems have been revised from that point of view. In a number of cases struts or braces have been interposed between the powerplant and the cross shaft, and it is understood that the object of this brace is to make up for lack of rigidity of engine mounting in the longitudinal direction. Since both the pedal and the brake lever are normally mounted on the powerplant, if the cross shaft were rigidly supported on a frame cross member, any slight longitudinal movement of the powerplant relative to the frame would affect the brake setting. There has been a notable gain in the use of wire cables for brake connections.

Frames have been generally stiffened, double-drop frames have been adopted for a number of the cheaper cars to permit of lowering the center of gravity, and in a good many cases channel inserts are used rather than main channel sections of great

depth, as any increase in the depth of frame section raises the body, provided, of course, that the body sets on top of the frame. Frames with side rails conforming to the outline of the body floor seem to be returning, taking the place of frames with side rails straight in the plan view, as conforming better with modern requirements with respect to low body height.

General Motors has developed a new spring shackle with rubber bushing, which is used on several of its lines of cars, and in this connection it is worth pointing out that the use of rubber in chassis and body construction has grown materially during the past year, both General Motors and Chrysler (and probably others) having had specialists investigate the possibilities of this material. An additional design of spring kick-shackle, a device intended to prevent wheel flight, has made its appearance on

Studebaker and Pierce-Arrow cars, and Pierce-Arrow also has joined the ranks of makers using metallic spring covers.

Centralized chassis lubrication has made some progress during the past year, in that at least one additional car maker is using it and that the systems on most cars now are automatic, requiring no other attention than periodical replenishment of the oil supply.

The great increase in the use of wire wheels on cars in the lower-priced class deserves to be mentioned. There has been a further decrease in wheel diameters, wheels with 17 in. base diameter being used in a number of instances. The semi-drop-base rim, which with the same width of tire cover gives a larger air capacity and hence a greater cushioning effect, is used in increasing numbers. With decreased rim diameters and large hubs, the spokes are becoming inconspicuous.

Accessories Section of Grand Central Palace Reacts to Optimistic Outlook

IF there has been any letdown in the development of new accessories during the past year, there was no evidence of it at the show. They were there in all shapes and sizes, and perhaps caught the popular fancy as much as did the new car and truck models themselves. At least it was evident on the opening day that a small booth exhibiting and talking up a 50-cent windshield cleaner device had as big a crowd of enthusiastic onlookers (and buyers) as were seen around any of the exhibits—and that was saying something.

The wisecracks of the trade had conclusively predicted that of all the phases of the show the accessory branch would have the fewest new developments. But not so. There were plenty of new accessories, proving again that ingenuity in this connection has not reached its limit—not even in a year of depression.

Radiator grilles were perhaps the latest of accessory creations, extensive displays of which were seen for the first time at a national show in this country. Almost as striking in their newness of development and extensiveness in exhibit were the mechanical signaling devices. Made in various sizes for car, truck and bus use, these are attached usually to the windshield stanchion. They are both manually and electrically operated and most are illuminated.

Clever redesignment made certain products more attractive and more useful, in keeping with vehicle design. This applied to such items as locks, windshield wings, heaters, horns, etc. There was a noticeable lack of certain products which heretofore had a wide appeal. Bumpers perhaps led this list. Trunks formed the basis of numerous displays and these were in yet new styles and construction. Shock absorbers, in previous years dressed up in action displays, were not so numerous, but standard models were shown in impressive exhibits.

In the past there has been a lot of discussion of just how much the sales department should have to say regarding the design of a chassis and what types of units should be used. Evidently this was solved in a very satisfactory manner by the Bendix

Co. by letting the sales department have the final word in designing a special car which was displayed in the Bendix booths. Regardless of whether the prospective customer was an advocate of mechanical or hydraulic brakes he would be satisfied, for both are to be found on this unique chassis. If he preferred battery ignition, he would not be disappointed, or if he liked a magneto, that also was to be had. True, the latter was belt driven, but that could hardly be held against this particular sales department designed car. Of course it was for display purposes only and brakes, ignition, carburetion, brake booster, instrument board, were all of Bendix manufacture.

What might be termed super-service station equipment is still receiving considerable attention by the manufacturers. Front wheel aligning equipment, pressure lubricators and car washers are improved in many instances and in addition new pieces of equipment have been added.

One interesting piece of equipment was a device which drew an actual graph of the riding qualities of a car. In the same booth there was a machine for testing the life of a shock absorber and by means of a graph the work done by a shock absorber could also be calculated.

Continental Motors exhibited a new four-cylinder double-opposed aircraft engine. Bore and stroke are $3\frac{1}{8}$ by $3\frac{3}{8}$ in., respectively, resulting in a displacement of 103.5 cu. in. At 3500 r.p.m. this engine develops 35 hp. and with a weight of approximately 140 lb. weighs 4 lb. per hp.

Correction

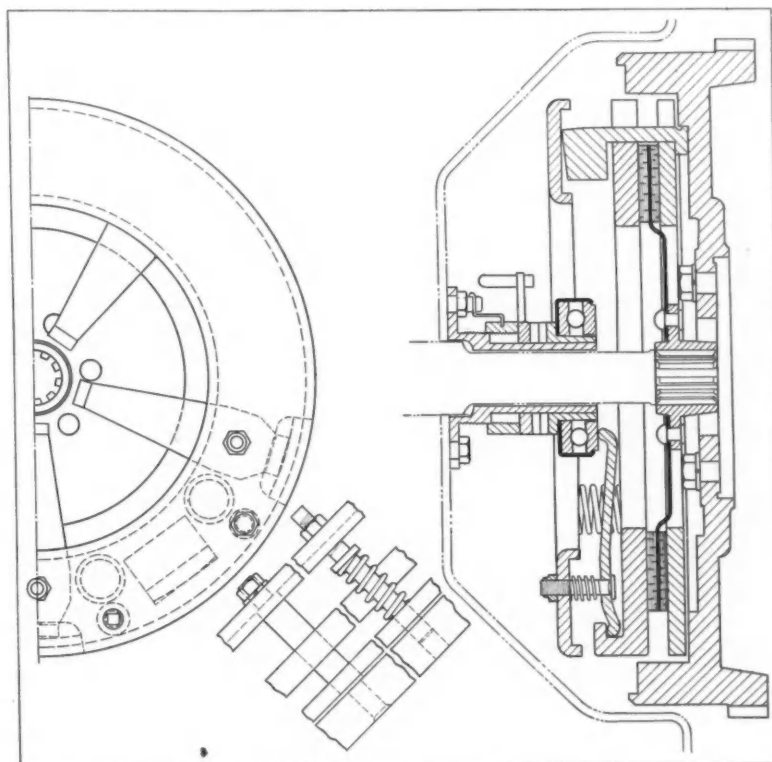
IN the item on the new Juhasz carburetor which appeared in our issue of Dec. 27, 1930, the statement "it claims will eventually eliminate carbon monoxide" should have been "it claims will virtually eliminate carbon monoxide."

New Automatic Clutch Makes Its Initial Bow at Gotham Show

AMONG the new devices making their appearance at the New York show was an automatic clutch for automobiles which has been developed by Automatic Drive & Transmission Co., Inc., of Gloucester, N. J. It is to be offered as a replacement unit in two sizes, one for Fords and the other for a number of other light cars, and it is also to be offered to the industry for original equipment. The officials of the company are E. S. Pleasanton, chairman of the board, and Wade Morton, president and general manager. Mr. Morton is a well-known former racing driver, who for a number of years recently was associated with Auburn Automobile Co. in an engineering and sales capacity. Arrangements have been concluded with the Long Mfg. Co. under which this company will manufacture the clutches.

At idling speeds the clutch is disengaged and as the engine is speeded up a number of weights subject to centrifugal force, which act as levers and use the flywheel face as a fulcrum, force the clutch disks into engagement. The disks are provided with friction linings having a low coefficient of friction, and with this type of clutch it is said to be practically unnecessary to operate the transmission or step on the clutch pedal under normal conditions of operation.

If it is desired to stop, the brake is applied. As the car slows down to an engine speed of around 400 r.p.m. the clutch is disengaged by coiled springs, and the engine idles while the car comes to a standstill. When it is desired to start up again, it is merely necessary to step on the accelerator. As the engine speeds up the clutch comes into engagement, the low coefficient lining insuring a smooth engagement. It is virtually



Details of the Powerflo clutch

impossible to stall, for if the torque load exceeds the engine torque, the engine immediately slows down and the slip of the clutch increases. It is, of course, impossible to accelerate as rapidly in high gear from a standstill as it would be to accelerate on the different gears in succession, but this is at least partly compensated for by

the fact that gears need not be shifted and no headway is lost while doing this.

The only additional parts of this clutch, as compared with ordinary designs, are six governor weights of about 1 lb. each, which revolve at engine speed. These weights are L-shaped, the major part of their weight being concentrated at the end of the long arm of the L. The weights are seated in the engine flywheel.

The clutch is designed for easy installation. On the Ford models the replacement clutch is interchangeable with the standard unit. For other makes of cars it is proposed to supply exchange flywheel-and-clutch assemblies for ready installation.

A button control is provided on the dash to enable the driver at will to lock the self-operating mechanism in engagement, so that the clutch can be used as a standard unit. The clearance between the two friction-lined disks is said to be between 0.005 and 0.010 in., and it is claimed that no adjustment is necessary after installation. Engineers of the company claim that the wear on the facings is surprisingly small, and that it compares favorably with the wear in the usual clutch. It is estimated that for Ford cars the cost of the unit installed will be in the neighborhood of \$50.

This clutch, known as the Powerflo, appears to be particularly applicable to door-to-door delivery units, such as are used on bakery and milk-delivery routes.

The American Mathis, A New Stream Studebaker "Six" and Nine Other New

By P. M. Heldt and

THE New York National Show opened its doors upon several new models not heretofore described, as well as a number of interesting mechanical improvements which were announced for the first time with the opening of the show Saturday, Jan. 3.

Although not yet in production, the American Mathis made its initial bow at the show. Listing at \$455 f.o.b. Lansing, Mich., this car is a development of the French car of the same name. It differs quite radically from the foreign product, however, in that all the units are designed for American production. The car itself is distinctly more conventional than what is commonly referred to as a "midget" automobile, at least as far as general layout is concerned. When interviewed by an editor of *Automotive Industries*, W. C. Durant, president of American Mathis, stated that he expected the car to get into production in time for April first deliveries.

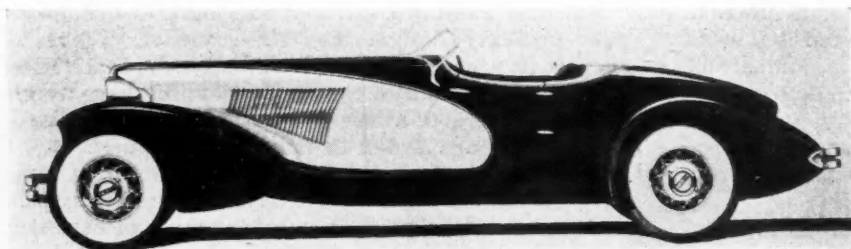
With a wheelbase of 96 in. and a tread of 48 in., the Mathis is being offered only in two-passenger models that are decidedly comfortable especially insofar as legroom and seat width is concerned. While the cars are to be merchandised as "economical transportation for two people," the singly and doubly adjustable seat will, if called upon to do so, accommodate three adults, as the writer verified for himself. The car is low in overall height due to the exceptionally low-hung frame, and with a fairly high and long hood represents a well-balanced body design. Standard equipment is

slated to include such items as rear view mirror, dash gasoline gage, automatic wiper, etc. Bright exterior parts are chrome-plated. According to Mr. Durant, the bodies will be built by the Durant Motor Co.

Chassis units, on the other hand, are to be manufactured by established makers in this country. Engines, Mr. Durant stated, will be manufactured by Continental Motors. They are of the four-cylinder type with a bore and stroke of $2\frac{3}{4}$ by $3\frac{1}{4}$ in. It is claimed to develop 31 hp. at 3200 r.p.m. It is of L-head design, with a roller chain-driven camshaft. Crankshafts are drilled for pressure lubrication and are supported in three main bearings. Pistons are distinctly unusual in that they are of the composite type with aluminum heads for high heat conductivity and cast-iron skirts for low expansion and good wearing qualities.

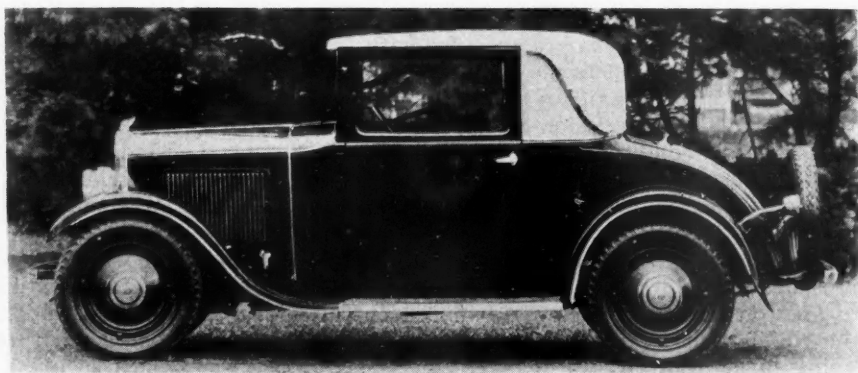
Complete details, dimensions, etc., on the Mathis engine are not yet definitely settled. An interesting detail is to be noted in the manifolding. The Tillotson carburetor is mounted directly at the intake manifold, with no vertical riser. The intake manifold is completely jacketed by the exhaust manifold, the unit being formed of a single-cored casting, which should make for economical production.

Engine mounting is of the four-point rubber type. Clutches are single-plate, and a standard three-speed selective gear transmission is mounted in unit with the engine. Other powerplant details include a two-unit, six-volt Auto-Lite electrical system, and thermosyphon cooling with a capacity of $8\frac{1}{2}$ qt.



Above—This Cord speedster, with its pronounced streamlining, was designed by a young art student

Right—The American Mathis, of which deliveries are to begin about April 1 + + + + +



lined Cord, a Free-Wheeling Offerings Enliven New York Show

Athel F. Denham

Two metal Spicer universal joints are shown in the cars at Grand Central Palace, as well as a semi-floating Adams axle with taper roller bearings and spiral bevel final reduction. Front axles are of the conventional reverse Elliott type of design. A screw and nut steering gear with roller thrust bearings is provided.

Brakes are Midland Steeldraulics, with a single cross-shaft hook-up, both the pedal and the hand lever operating all four-wheel brakes. Springs are semi-elliptic and take both torque and propulsion in the conventional Hotchkiss manner. Shackles are of Tryon make. Eighteen-inch disk wheels with 4.00-in. section semi-balloon tires are used. There are five cross-members in the fairly conventional frame. Radiators are of Fedders make, and a chrome-plated screen may be placed in front of the core. Chassis lubrication is by means of pressure gun fittings. Gas tanks hold 9 gal. Seats, as well as being adjustable fore and aft by lifting the seat cushion, also have provisions for adjusting the seat back angle. The seat back is hinged to the seat frame at the bottom, and is supported from the front seat cushion by tension straps, with adjustable buckles. This construction also makes for

a considerably more resilient seat with lighter weight. Weight of the car complete is in the neighborhood of 1500 lb.

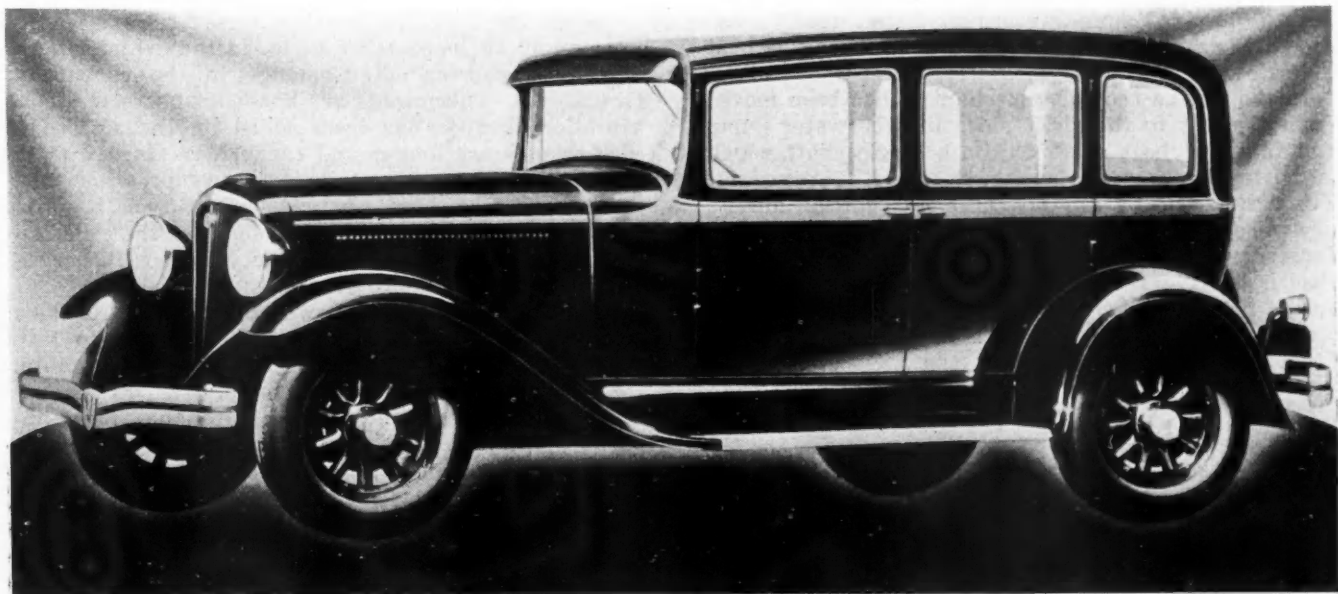
Cord

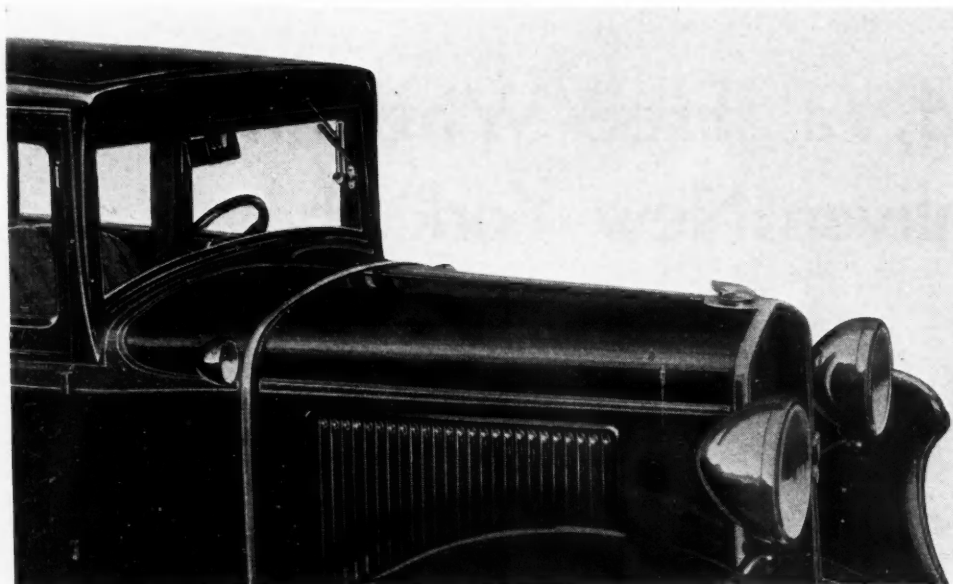
ONE of the most striking cars exhibited at the New York show was a new addition to the Cord front drive line, prices on which were sharply reduced. Fenders were particularly striking in their streamline effect, the fender back of the wheels having as deep a skirt at the outside as on the inside and tapering back in the same manner as cowling now being used on airplane landing wheels to reduce their air resistance. The rear of body is quite pointed. The windshield slopes back at a sharp angle, is quite low and Vee-shaped to reduce air resistance. Even the door hinges have been given a streamline shape. Hood louvers on this model are at an angle to carry out the streamline effect.

Studebaker

THE Studebaker Corp. announces a new Six equipped with free-wheeling device and having the same frontal appearance as the other new Studebaker models brought out several months ago. Prices on the Six remain substantially the same, ranging from \$795 to \$995.

The new Studebaker Six, with its free-wheeling device, is offered at about the same price range as the former six line





The bodies of the new De Soto are of all-steel construction and the windshield mounted at an angle + + + +

The radiator on the new model De Sotos appears to be deeper, an effect accentuated by the vertical shutters + + +

The transmission on the six is quite similar in design to that used on the larger, eight-cylinder models. Six body styles are offered on the new chassis, which retains the 114-in. wheel-base, viz., a five-passenger, four-door sedan; a five-passenger Regal sedan; a two-passenger business coupe; a rumble-seat coupe, and a tourer and Regal tourer, both with folding tops. The tourers and the business coupe are finished in leather, the Regal sedan in Bedford cord, and all other models in mohair. Regal models carry six wire wheels, front-fender wells, and a folding-trunk rack.

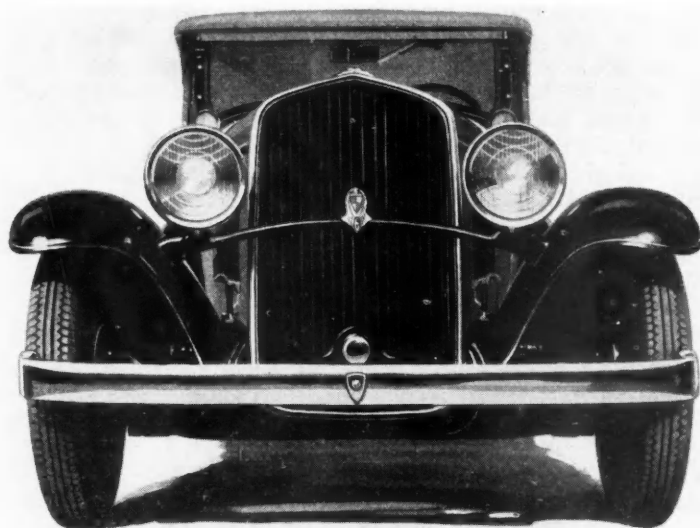
Double-drop frames have been worked out to lower the center of gravity and overall height of the new cars; body moldings have been revised, and rear quarter panels have been shaped to give an effect of decreased roof height. Equipment includes rear side arm rests in the closed models, draw shades on rear-quarter windows, dome lights, tourer curtains that can be left up for windbreaks when the top is down, adjustable seats and steering columns on all models, three-spoke steering wheels, cowl ventilators, a swinging-type ventilating windshield, an automatic wiper with a concealed mounting, a rear traffic signal, a hydrostatic dash gasoline gage, and a dash engine heat indicator.

In the engine the valve mechanism has been moved from the left to the right side, and the water pump and fan have been combined on a single shaft which is driven by the same belt that drives the generator. The driveshaft for the oil pump and ignition unit is now mounted at an angle to the block. A vibration damper with vulcanized rubber hub is fitted, the shock absorbers have rubber-bushed links, and the starter button is now on the dash.

No further changes have been made in the other Studebaker models, except that on the Dictator eight; the headlamp tie bar is now also concealed behind the radiator vanes.

De Soto

INCREASED power and improved appearance are characteristic of the new De Soto six and eight-cylinder models introduced at the New York Show.



Narrow-profile radiators appear once more on both these cars, while the use of a double-drop frame on the six-cylinder model has been effective in lowering it.

In the De Soto Six the engine power has been increased by an increase of $\frac{1}{8}$ in. in the cylinder bore, and by a corresponding change in the carburetor throat. A vulcanized or bonded-rubber torsional vibration damper has been added on the six. The pistons now are longer and carry four rings, two of the Tung-tite type, one recessed compression ring and one oil ring. The compression ratio has been increased slightly, a change in the shape of the compression chamber having made this increase possible without necessitating going to anti-knock fuels.

Increasing the engine power has made possible a reduction in the rear-axle ratio of from 4.6 to 1 to 4.33 to 1, thereby increasing road speeds. A 9-in. single-plate clutch has been adopted.

In frontal appearance the radiator has been apparently increased in depth, this impression being emphasized by the vertical shutters, which extend to the top of the radiator shell, with a false bottom below. Headlamp tie rods are arched and carry the new emblem, which has been removed from the shell. Parking lamps on the cowl are standard equipment, while

single-bar bumpers are furnished at an extra cost.

All-steel construction has been retained for the bodies. Windshields are now of the swinging type and are mounted at an angle, to reduce glare. The windshield header bar has no visor, and molding treatment has been revised, especially on the two-passenger models.

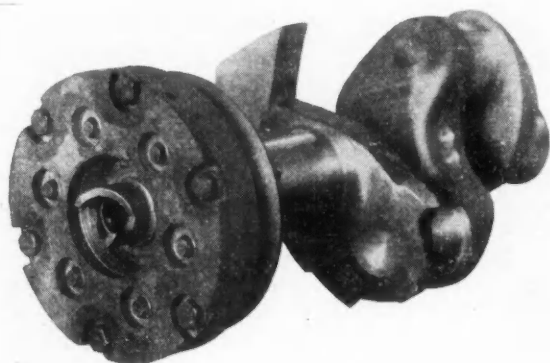
All instruments, including a water heat indicator and a dash gasoline gage, are now grouped in an oval panel indirectly lighted, and framed with a chromium-plated bead.

In the De Soto Eight, power has been increased to 75 hp. at 3400 r.p.m. by virtue of a $\frac{1}{4}$ -in. increase in the stroke. This increase in power is reflected in the top speed of the car by dropping the gear ratio from 4.9 to 4.6 to 1. The compression ratio has been increased to 5.4 to 1, and the compression chamber shape changed to make this increase possible without increasing the detonating tendency.

Engine dimensions now correspond generally with those of the 1930 Dodge Eight, and as compared with the previous De Soto the crankshaft is heavier and rubber-engine mountings are used at front and rear. The piston displacement is now 220.7 cu. in. A larger single-plate clutch is used on the eight also.

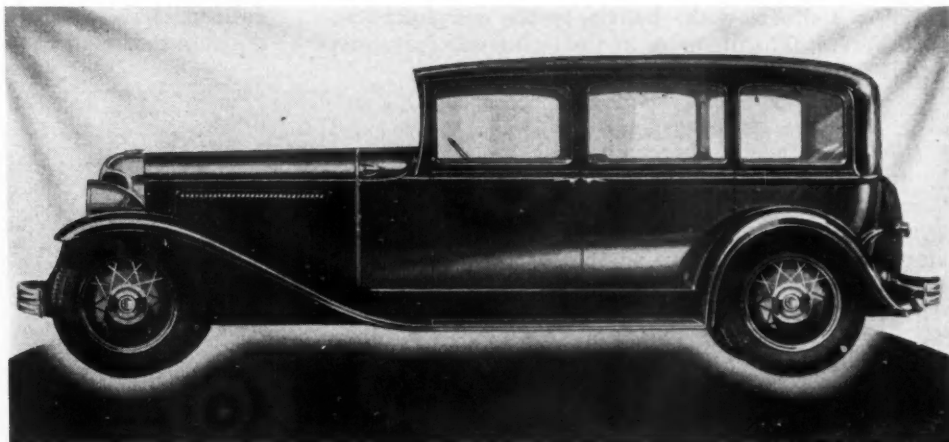
Bodies construction is changed only in details, although the French Pleat upholstery is new, as is the design of the interior hardware and the instrument panel.

The front end of the De Soto Eight corresponds with the changed frontal appearance of the new six, with its narrow-profile radiator, deep shutters and arched headlamp tie-bar carrying the new crest. Headlamps on this model are chrome-plated.



Details showing the vulcanized rubber type torsional vibration damper provided on the new Chrysler Six crankshaft

Chrysler Six sedan, showing the five wire wheels used as standard equipment. Note the long hood. The engine now develops 70 hp. + +



Chrysler

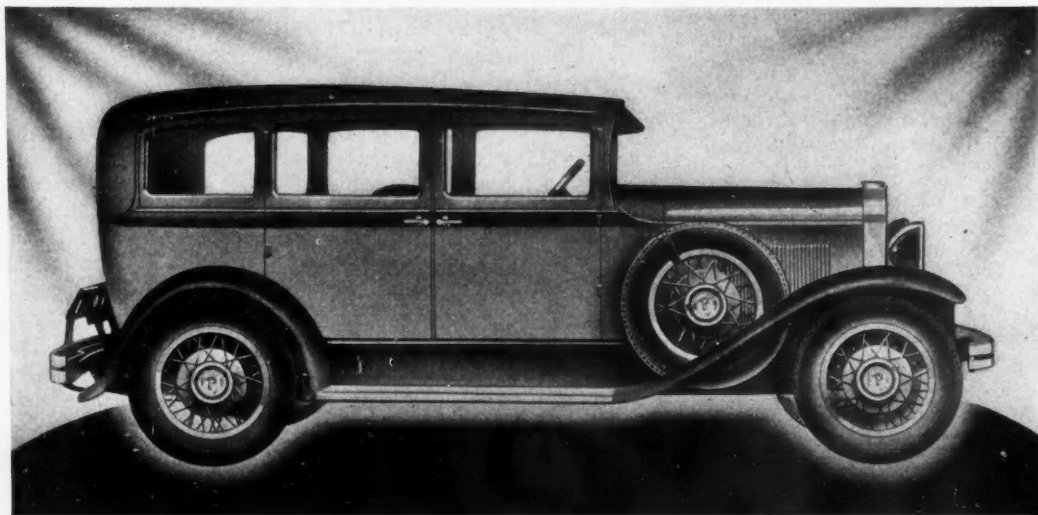
A NEW Chrysler Six with longer wheelbase, higher horsepower and new bodies modeled on those of the Chrysler Eights, is being announced by the Chrysler Sales Corp. With an increase in overall length by seven to eight inches, represented by a wheelbase increase to 116 in., through the use of a double-drop frame giving an overall height of about 68 in. and the use of a V-shaped radiator front, entirely new styling has been worked out for this car.

Particularly noticeable on the Chrysler Six (or model CM) is the long hood emphasized by the wide central portion of the chrome-plated radiator shell. Bodies are dressed up at the front end by the elimination of the sun visor, and five wire wheels are standard equipment. In the interiors there are such features as Bedford cord upholstery, center arm rests at the rear in addition to side arm rests, three-spoke steering wheels, assist cords, adjustable front seats, etc. Windshields are of the slanting type to reduce glare, and swing outward for ventilation. Two top cowl ventilators are also provided. There are also cowl lamps and a chrome-plated saddle band. Windshield frames are chrome-plated.

Four body models are to be offered on the new chassis, viz., a sedan, coupe, convertible coupe and roadster. While prices are not yet available, it is expected they will be slightly higher than those at present in effect on the Chrysler Six.

The engine now develops 70 hp., as against 62 last year. Cylinder dimensions are $3\frac{1}{4}$ by $4\frac{3}{8}$ in., as compared with $3\frac{1}{8}$ by $4\frac{1}{4}$ in. previously, which has added 22.2 cu. in. to the displacement. The compression ratio remains unchanged, and a torsional vibration damper has been added to the crankshaft, this damper being of the vulcanized rubber type. The engine is now mounted in rubber at all four points, whereas in the 1930 series rubber was used at the rear only. Other internal changes in the engine include the adoption of a full floating piston pin of larger diameter ($\frac{55}{64}$ in.), the provision of an additional compression ring $\frac{1}{8}$ in. wide and of the recessed type, and an increase in width of the oil ring to $\frac{5}{32}$ in. Intake valves are slightly larger, with a $1\frac{17}{32}$ -in. head diameter, to provide for the increase in displacement.

No change has been made in the clutch, but the ratios of the second and low speeds in the transmission



In the powerplant as well as bodies a number of changes have been made in the Plymouth line. This illustration shows the new four-door sedan + +

and the final drive ratio have been lowered, to take advantage of the increased engine power. The rear-axle ratio is now 4.66 to 1, while the ratio of the second speed in the transmission is 1.79 and that of the low speed, 2.75 to 1. The rear axle is also heavier than formerly, the stamped housing now being made of 3/16-in. stock.

In addition to being of the double-drop type, the frames have been strengthened by increasing their channel depth to 6½ in. and the width of the flanges to 2 in. The addition of another cross member has increased the number to five, exclusive of the engine supports. An increased cruising range resulted from the provision of a larger fuel tank (15½ gal.). Steering wheels are now 18 in. in diameter, which represents an increase.

Plymouth

SINCE March 10 last, a number of important improvements have been made in Plymouth cars, particularly in the powerplant, although no public announcement of such changes has been made up to the present time.

The adoption of a water pump, driven, together with the radiator fan, by a V-belt, made it possible to do away with the large, lower radiator tank. In the fuel system the vacuum tank was replaced by a mechanical pump some time ago, and the carburetor jet size was altered to conform with changes in the camshaft and intake valves. The diameter of the latter was increased from 19/16 to 1 11/16 in. last summer, at the same time the valve lift was increased from 9/32 to 5/16 in. A corresponding increase in inlet manifold diameter was also made, and a type of muffler was adopted which reduced the back pressure on the exhaust.

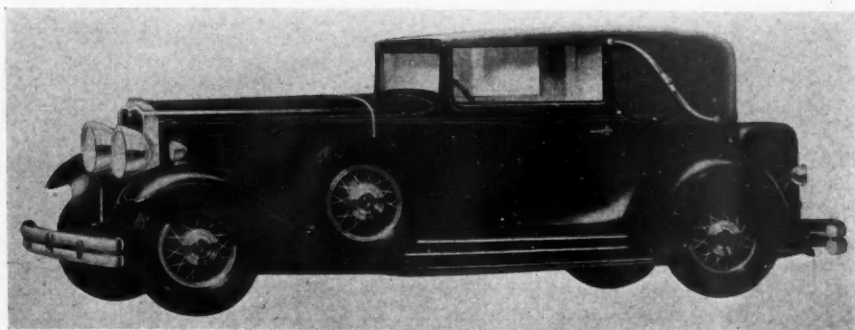
In the lubricating system the

vane-type oil pump has been replaced by a gear pump, which is located and driven the same as the superseded pump. The changes in the carburetor, intake manifold, valves and camshaft are said to have increased the engine power from 45 to 48 hp. The generator, which is located on the left side of the block, is now driven by the V-type fan belt, its mounting providing the means for belt adjustment.

Hydraulic shock absorbers are now standard equipment on all Plymouth cars. Body changes, aside from those intended mainly for the improvement of appearance, include the adoption of a horn mounted on the headlamp tie bar, of an electric dash gasoline gage, and of a three-spoked steering wheel.

Nash

A CONVERTIBLE sedan for four was announced as an additional model of the Nash line at the opening of the show. It is offered as combining the advantages of the roadster and the closed car. It comes with a Burbank top which is said to be easily adjustable and to contain no more working parts than the Nash cabriolet tops, and it is built on the Nash twin-ignition 8-80 chassis. The doors are exceptionally wide and afford easy access to both the front and rear seats. They are of the cabriolet type, and the windows in them may be left up for wind protection even when the top is folded back. The windshield also is of the cabriolet type and can be adjusted by the driver as desired. Five wood wheels and a rear trunk are among the items of equipment.

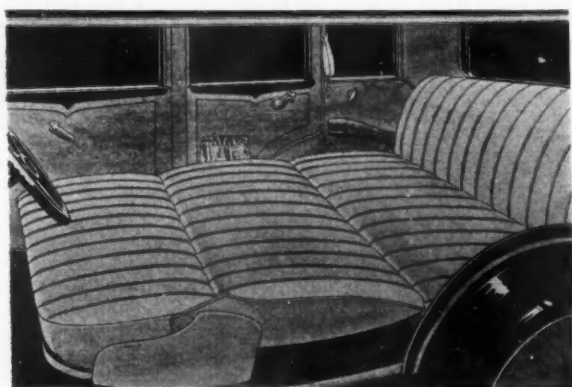


Nash convertible sedan on the 8-80 chassis + + +

Chevrolet

THE addition of three sport models featured the Chevrolet showing. The line consists of a convertible phaeton-sedan of the close-coupled two-door type, but with a surprising amount of legroom, a five-passenger coupe along similar lines and a convertible cabriolet. The convertible phaeton can be operated with the top up, with or without the center pillars in place. There are four windows in chrome-plated frames. Door are wide. Front seats are of the individual type with the driver's seat adjustable. Frame for the forward folding windshield is chrome-plated, with a chrome-plated inside cowl bar trim.

Upholstery is genuine leather, while the equipment includes two ash trays, leather side arm rests in the rear, engine-turned instrument panels with the standard Chevrolet instrument equipment and large cowl ventilator. The rear curtain, if desired, can be buttoned up under the roof. There is a good-sized tool and luggage compartment in the "rear deck" of this model. It lists at \$650.



"Pullman" type of front seat which is standard equipment in the Durant 610 and 612 models + + + + +

Along the same idea of body design, with the double curvature rear deck, the Chevrolet five-passenger coupe with folding front seats lists at \$595. The spare wheel mount has a slight tilt. Equipment is similar to the convertible phaeton. Toggle grips are standard equipment.

Durant

ADDED to the Durant 612 line, coincident with the opening of the New York show, is a five-passenger sedan designed for chauffeur operation. Sliding glass panels divide the front from the rear compartment. The front compartment is upholstered in leather, with the seat cushion

New convertible cabriolet on the Chevrolet sport line. Chevrolet also shows two other new de luxe body types, a five-passenger coupe and a convertible phaeton

in two pieces, the right half of which is removable so as to enable carrying trunks or baggage in front, there being no seat frame for this part of the seat cushion, except that contained in the cushion itself. It lists at \$825. It is of course readily convertible into a taxicab, and is to be offered for such purposes also, in which case folding auxiliary seats will be attached to the back of the front cross seat of course.

Buick

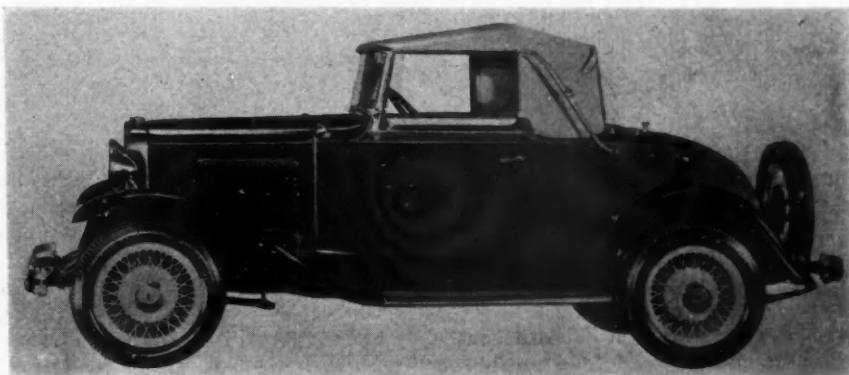
HEREAFTER the Buick 8-50, the smallest of the four Buick eight-cylinder chassis, will be equipped with a synchromesh transmission and with torque-tube drive, the same as the three larger Buicks. The transmission carried by the 8-50 is the same as that on the 8-60. Except for dimensions, all of the four Buick lines are now of substantially the same design, having in addition to the synchromesh transmission and the torque-tube drive, such features as the oil cooler, or oil-temperature regulator, and the air-intake silencer.

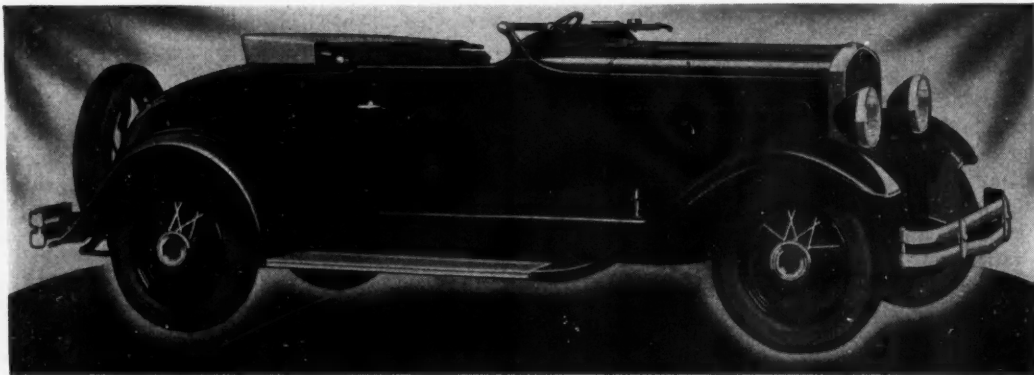
Stutz

THE Stutz Motor Car Co. shows a chassis with a dual-valve engine, which is said to develop 50 per cent more power than their regular engine, rating at 150-160 hp. at 3900 r.p.m. In general design this new DV-32 engine follows the regular Stutz eight-cylinder model, its bore and stroke also being $3\frac{3}{8}$ and $4\frac{1}{2}$ in. respectively. The valves, which are located in the cylinder head, are inclined at angles of 45 deg. to the cylinder axis. Each valve has a clear diameter of $1\frac{3}{16}$ in. and the two together are said to have a valve capacity 61 per cent greater than that of the single valves in the regular engine, which have a clear diameter of $1\frac{1}{2}$ in. Valves are actuated directly by cams above them, as in the single-valve Stutz engine. There are, of course, two camshafts on top of the engine, one for the inlet and the other for the exhaust valves. These camshafts are driven by chains, which also drive the radiator fan.

Owing to the fact that the valves are smaller and are inclined to the cylinder axis, better cooling is obtained for the valve seats, and the spark plug for each cylinder is located at the center of a cone-shaped combustion chamber. This is a better location for the spark plug than was available in the single-valve engine, for which reason the dual ignition system is not used on this engine.

The carburetor is a Schebler dual, and is of larger size— $1\frac{1}{2}$ in.—than used on the regular Stutz engine.





This new model Essex Super Six Sport Roadster with boat-shaped rear deck and rumble seat is having its first public showing at the New York Automobile Show +

It feeds the engine through a dual manifold, of which one branch supplies the four outer cylinders and the other the four inner ones. On the riser of the dual manifold there is an exhaust jacket. On the opposite side of the engine there are two exhaust manifolds, one for the four forward and the other for the four rear cylinders, each with its own "down-take," the two down-takes being close together at the middle of the engine. In the forward exhaust manifold there is a heat-control valve, and when this is properly set, exhaust gases from the three forward cylinders, which are ahead of the control valve, pass through arch-shaped pipe across the top of the engine to the jacket on the inlet riser, and then back to the exhaust side through a similar pipe parallel with the first men-

tioned, which discharges into the down-take of the exhaust manifold for the four rear cylinders. The proportion of the exhaust from the three forward cylinders which goes to the inlet jacket can be controlled by the valve.

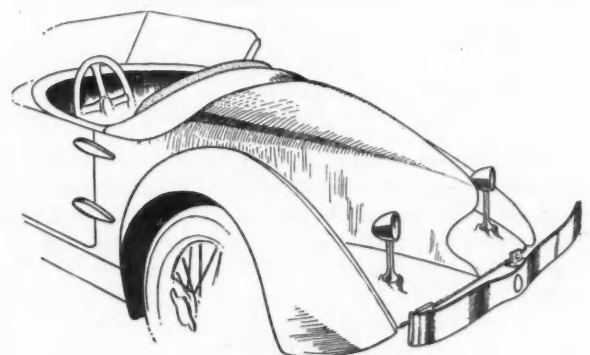
The water pump is located at the rear end of the cylinder block and cooling water enters the cylinder jacket there; it returns to the radiator through a water return manifold with seven connections to the cylinder head. Alongside of this water return manifold is located the conduit for the spark-plug cables.

Cars with the new dual-valve engines will be made in three lengths of the wheelbase as follows: Model LA, 127½ in.; Model MA, 134½ in.; Model MB, 145 in.

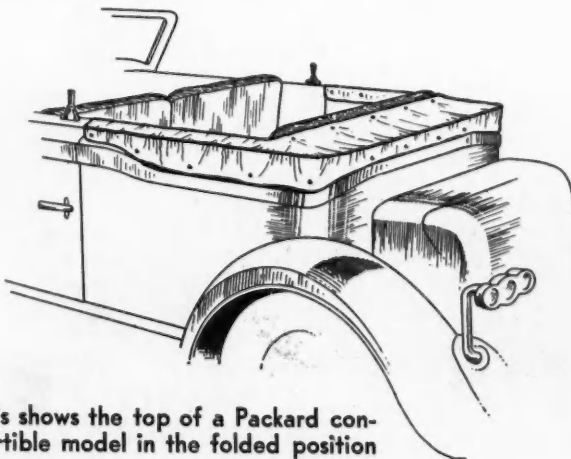
Body Details Sketched at the Show



The frontal appearance of the Lincoln has been changed considerably, as may be judged from this cutaway view + + + + +

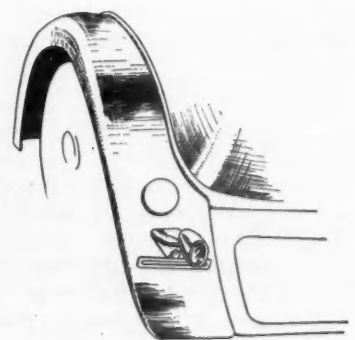


A special La Grande speedster body on a Cord chassis was one of the centers of attraction at the show + + +



This shows the top of a Packard convertible model in the folded position

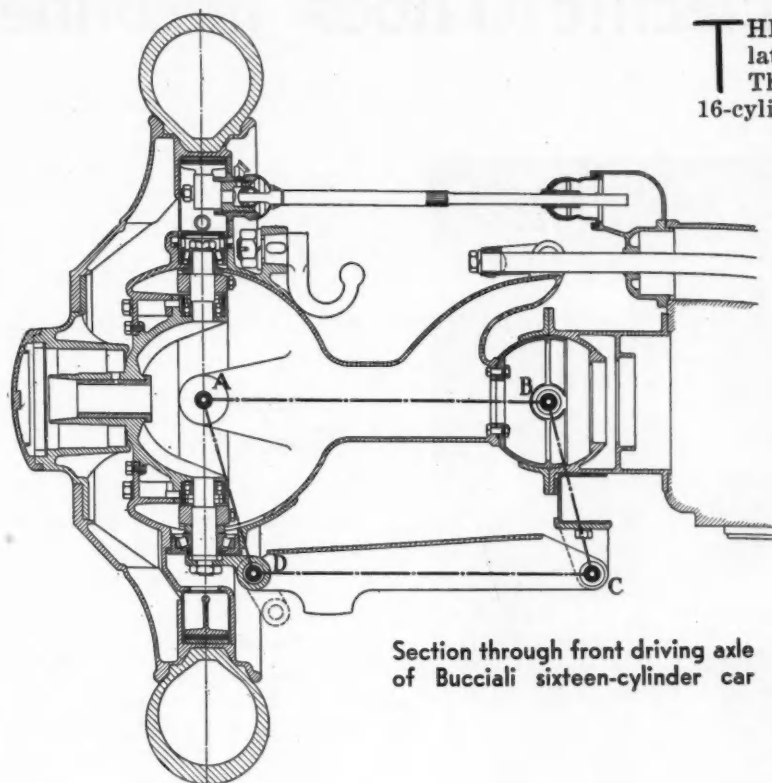
On the new Marmon the fuel tank is completely hidden from view and the tank filler is arranged on the rear of the fender + + +



January 10, 1931

Automotive Industries

Latest Bucciali Front Drive Shown



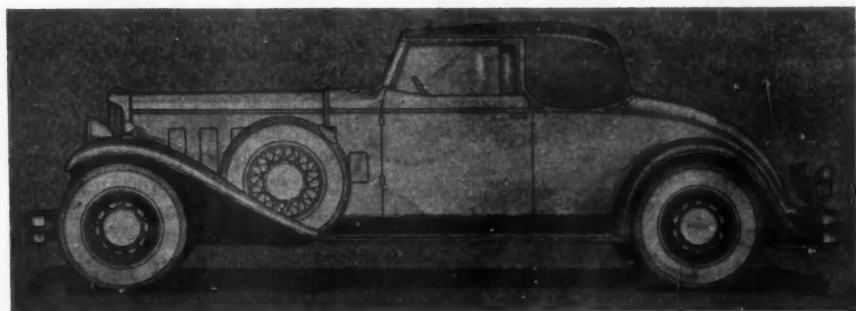
Section through front driving axle of Bucciali sixteen-cylinder car

THE drawing reproduced herewith shows the latest design of the Bucciali front-wheel drive. The construction here shown is used on the new 16-cylinder car which was brought to this country by Messrs. Angelo Bucciali and C. S. Johnston and exhibited at the Hotel Commodore, New York, during the week of the New York show. In a general way the new design is similar to the old one in that the steering head is connected to the central housing by parallel links (A-B, C-D) so that the front wheels always maintain their vertical position. The lower of these links inclose the transverse springs. The details have been considerably modified, however, and one of the most outstanding features is the large size of the housing for the universal joint within the steering head. This large size evidently is made necessary by the large amount of power to be transmitted, the 16-cylinder engine having a bore of $2\frac{7}{8}$ and a stroke of just under $4\frac{3}{4}$ in., the displacement being approximately 480 cu. in., and the power generated, 170 hp. at 300 r.p.m. In this, as in the previous, smaller Bucciali car, the transmission is located on the front axle, the bevel-gear reduction set being located ahead of the speed-changing gears.

Mercer to Be An Eight-in-Line

THE new Mercer, which is to be produced by an organization concerning which an announcement appears in the news columns this week, is to be manufactured at Elkhart, Ind. It will be a semi-custom-built type of car, with bodies by Merrimac, prices for the eight body styles will be from \$2,650 to \$4,000.

Mechanical features include a Continental eight-cylinder $3\frac{3}{8}$ by $4\frac{1}{2}$ -in. engine, claimed to develop around 140 hp. for a displacement of 322 cu. in. The engine will have Bohnalite pistons and a Lanchester torsional vibration damper. Other powerplant features include automatic radiator shutters in addition to thermostatic circulation control, four-point rubber mounting, duplex carburetion and Delco-Remy electrical units.



One of the eight body types in which the new Mercer is to be made

The clutch is to be of the two-plate type and the transmissions will be of the four-speed variety with quiet third speed. Rear axles are semi-floating worm-driven Timkens, with under-mounted worms, which in connection with a double-drop frame assures a low center of gravity and low overall height. A top speed of 100 m.p.h. will be guaranteed, the writer was told.

The double-drop frames have 8-in. side channels and seven cross-members. Six wire wheels, with the spares mounted in fender wells, will be standard equipment. These wheels will take 7.00-in. cross-section tires. A trunk rack will dress up the rear of the cars.

Springs are provided with Belflex shackles, and with metal spring covers. There are two metal universal joints in the propeller shaft. Steering is by a Ross cam-and-lever gear. Shock absorbers will be double-acting hydraulics.

Body equipment is said to be unusually complete, especially as regards interior fitments. Exterior bright parts are finished in chromium plating and fender parking lights are provided. The radiator is V-shaped; there are both top and side cowl ventilators, while louver doors are provided in the hood. The windshields are of the sloping, non-glare type.

Fitting Photo-Electric Tubes Into the



by
Joseph
Geschelin

GENERAL applications of photo - electric tubes (commonly known as photo - electric cells) in automotive production may be classified roughly as follows: (1) Indicating and recording; (2) Sorting, grading and matching; (3) Automatic control, relaying, etc.

Specific examples of some of these are: counting items where high speed is required; where products possessing high temperatures might wear out the mechanical counter, and in general wherever items cannot be readily counted by the usual mechanical counting. Also for starting and reversing automatically any type of machine tool, opening doors, temperature indicators, etc. Another use is as a safety device on machinery where the workmen may come into contact with the moving part, for example, as on a press.

Right now the photo-tube made by Westinghouse Electric & Mfg. Co. and the General Electric Co. is available commercially to the industry, the final step having been made rather recently with the development of another type of tube designed to amplify the minute currents produced by the photo-tube. It is quite natural that early applica-

Scheme of Automotive Production

This new device of the industrial world can be made to solve many problems

Fig. 1—Westinghouse amplifier unit consisting essentially of a photo-tube and the grid-glow tube

tions of the photo-tube would be spectacular in order to attract the attention which they deserve. Accordingly, a number of striking installations have been made in steel mills, paper mills, in the Holland tunnels, and on certain technical applications such as in the color analyzers which were described in *Automotive Industries*, Dec. 6, 1930.

Fig. 1 shows the Westinghouse amplifier unit consisting essentially of the photo-tube (the small tube) and the grid-glow tube which amplifies the feeble current produced; the General Electric unit, one of which is shown in Fig. 2, providing amplification by means of the phototron. However, in all cases the object is to provide a self-contained unit with sufficient amplification to operate a suitable electric relay mechanism.

As the reader has already noted from current literature, the photo-tube is a light-sensitive tube which produces a small flow of current to an external circuit under certain conditions. The scheme of operation is to project a beam of light through an intervening space to a photo-tube, and with voltage applied to the tube a current passes from anode to cathode by means of electron emission. Any interruption of this light beam results in the tube receiving more or less light, resulting in a greater or smaller current flow through the tube. The apparatus is connected so that this minute current is used to control the amplifier tube. When the photo-tube is illuminated, the amplifier tube does not pass current and the relay is also deenergized. When the photo-tube is darkened, the amplifier tube passes current and the relay operates. Therefore, the relay contacts close each time the beam of light is interrupted and open when it is restored. The circuit also can be arranged to operate in the opposite sense.

The photo-tube may be activated in a number of ways, all intimately related to the utilization of a beam of light, among which are the following:

1. By a change in reflection coefficient.
2. By changing the transmission coefficient.
3. By changing the refractive index.
4. By the action of light received from a light source



- which is being measured, such as the measurement of temperature of a bar of glowing metal.
5. By interrupting the beam from a fixed light source.

Three fundamental mechanical arrangements shown in Fig. 3 may be modified to suit any specific application. In the arrangement shown at B, if the material interposed is transparent, such as cloth, glass or paper, there will be a difference in transmission coefficient depending upon the thickness of the material. On the other hand, a solid object may be interposed so as to shut off the light, and thus operate the simple light relay described earlier.

It is well to note here that the working area of the photo-tube is small, and where a large area of control is desired, a number of tubes must be grouped together to cover the entire range. This problem would occur only in special cases, but it is well to be familiar with it.

Just what is the significance of this new tool to the factory executive? For one thing, it is now possible to get a simple outfit consisting of the photo-tube, amplifier and a light source for experimental purposes. By means of this portable and universally applicable unit, the tool engineer can determine the desirability of a photo-tube application. Where desirability is established, this outfit will help to determine the nature of the permanent installation, type of light source, and degree of sensitivity. Electrical circuits and relays have not been discussed because they constitute a separate problem which the manufacturers of electrical equipment will be glad to solve.

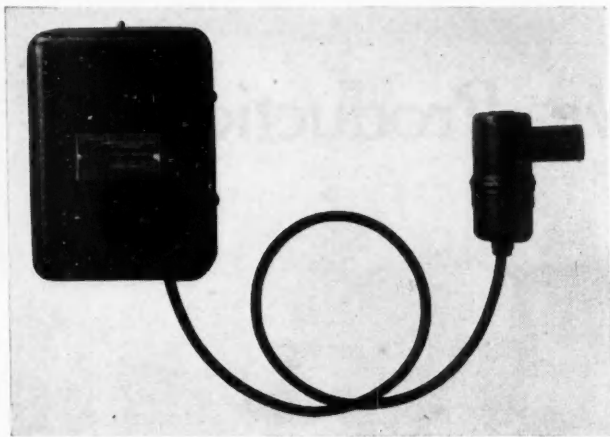


Fig. 2—The General Electric provides amplification by means of a phototron + + + + +

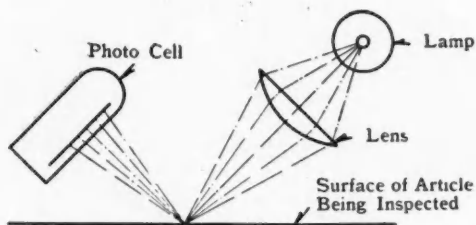


Fig. 3A—The photo-electric cell may be operated by a reflection of light from a smooth surface + +

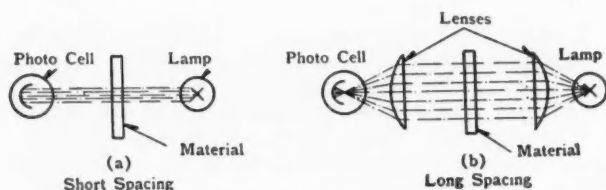


Fig. 3B—Placing objects between the light source and the cell can vary the transmission coefficient, hence the cell output + + + + +

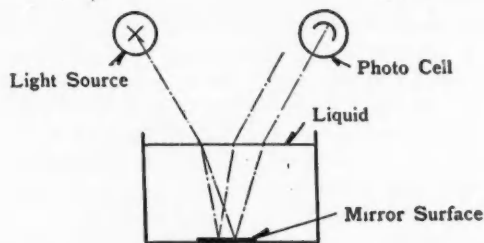


Fig. 3C—Refraction of light is a typical method of actuating a photo-electric cell + + + + +

Invariably the true significance and potentialities of a new discovery or a new tool depends largely upon the ingenuity and inventiveness of the user. This is particularly true here, and it is hoped that enough information has been given to enable the tool engineer and factory executive to put the photo-tube to work on some of his own problems. Perhaps a few of the more recent installations may indicate some of the ways in which this unit may be utilized.

For example, in a certain steel mill a row of furnace doors fed by a traveling crane is now automatically controlled by the photo-tube. Each door is fitted with a light relay while a single light source is located on the cab of the crane. To open any door, the operator simply snaps on the light. Another application is a positive safety guard for a punch press. Here the light beam is thrown across the front of the press with the circuit so arranged that the motor will not run when the beam is interrupted.

An installation which may suggest a train of thought is the use of the photo-tube for measuring the length of work and operating a shear to cut it off. For instance, in the manufacture of trimming materials, such as wind lace, a light beam located at the proper distance from the sewing machine can measure the length of the work and as the light beam is interrupted can operate the cut-off shear. Varying lengths can be readily obtained by shifting the light source and photo-tube in the proper direction. In the steel mills it may be possible with the proper type of photo-tube acting as a pyrometer to measure the temperature of steel billets within a luminous range about 1300 deg. Fahr. and over. Perhaps a similar arrangement might be made to serve in automotive forge shops to measure the temperatures of the stock before it is placed in the forging die. Incidentally, this same arrangement besides indicating temperature may be made to ring a bell or sound some other warning signal.

Counting packages or parts traveling on an overhead conveyor can be readily handled by the photo-tube. In case of packages, the measurement may be made by reflection from the package, while in the case of parts traveling on the overhead conveyor, counting may be effected by interrupting the light beam. In any event, this method offers the solution to counting problems which may not be handled readily by the ordinary mechanical counter or where the service may be too severe.

The field of application is so broad and the opportunities of solving otherwise difficult problems so real that it would be well worth while investigating the applications of this new tool. Realizing that this problem usually will require the assistance of technologists, we shall be glad, indeed, to serve as a clearing house for suggestions concerning your own technical problems. Moreover, we shall be glad to initiate a study of any problems which you think might be solved by means of this new tool.

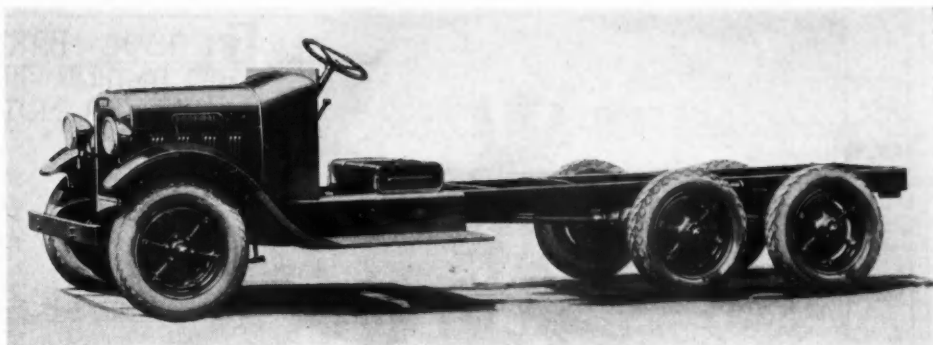
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Lewis R. Koller, *Journal of the Optical Society of America*

Six-Wheel DSW Federal Trucks Rated to Carry 2½ to 3-Ton Loads

Specifications Model DSW

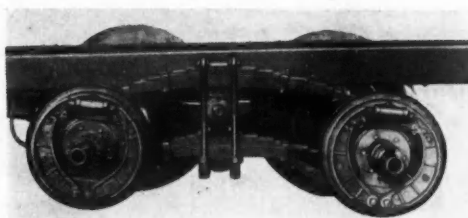
Transmission speeds4
Rear axle, type.....full-floating
drivebevel
ratio standard.....6¾ to 1
ratio, optional.....5.2/5 to 1
Frame size.....6 x 2¾ x ¼ in.
Tires, front6.00/20
rear32 x 6



Federal six-wheel Model DSW

A NEW six-wheel, two-wheel-drive truck of from 2½ to 3 tons capacity and of unusually low frame height has been added to the line of the Federal Motor Truck Co., Detroit. This new unit, designated as Model DSW, is available with either a four-cylinder, 48-hp. engine or a 60-hp. six, each in two frame lengths.

While only the forward of the two rear axles is alive, both axles are mounted in a unit through two pairs of parallel inverted semi-elliptic springs, trunnion-mounted on the frame. Drive and torque of the front axle are taken through these springs, and axle twist due to road irregularities is avoided by the method of attaching the springs to the axles. The method employed is unique. Both axles are fitted with brackets, rigidly attached, to which the spring ends are secured. The ends of the lower springs are attached to the brackets by bolts similar to those employed in assembling front ends of front springs in a conventional truck. The front end of the upper right spring and the



The parallel springs are held together by U-bolts with trunnion blocks between

rear end of the upper left spring are attached in the same manner. The two remaining upper spring ends are shackled to the brackets. By shackling one end of one of the two springs at each side, each end of each axle can rise or drop with road irregularities without twisting the axles.

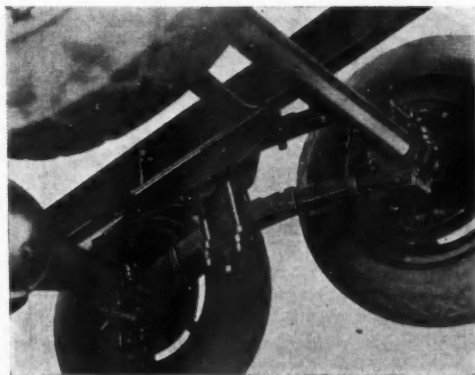
The parallel springs are held together by U-bolts with trunnion blocks between, about which the entire

rear axle unit oscillates. These shafts rotate in large bearings located in frame brackets that in turn are attached to the under side of the frame side rails. These brackets have long top and bottom flanges which also act as frame-reinforcing members. The shafts themselves are said to be of patented Federal design and incorporate oil reservoirs which through wick members supply the trunnion-shaft bearings with oil. Oiling connections for replenishing the reservoir are located on top of the spring.

An increase in tractive effort for the driving member of the six-wheel unit is obtained by offsetting the springs relative to the trunnion pin in the frame-supporting bracket, thus throwing additional tractive load on the front wheels of the unit. Further claims for the Federal design include less unsprung weight by taking torque and propulsion through the springs, increased ground clearance for the axles by installing the lower pair of springs close to the trunnion points, and greater steering ease, due to more stable operative action of the axles. Special propeller shafts permitting a maximum deflection of 30 deg. are provided.

All six wheels of the new Federal 2½-to-3-ton truck are provided with brakes having 15-in. diameter, 2-in. wide drums, brakes, of course, being hydraulically operated. An 8 x 2½-in. drum on the propeller shaft provides the emergency brake.

The four-cylinder models are listed at \$1,050 and \$1,120 while two six-cylinder models are offered at \$1,307 and \$1,392.



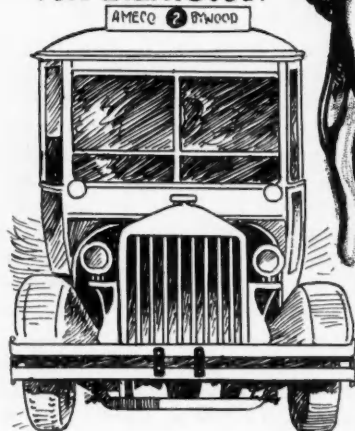
The center axle of the 2½ to 3-ton, six-wheel models is mounted in a unit with the rear live axle

Automotive Oddities—By Pete Keenan



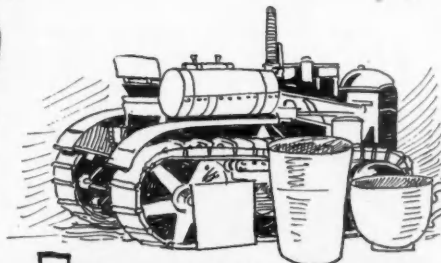
ON 1896 BARNUM & BAILEY HAD AS THEIR CHIEF ATTRACTION A DURYEA MOTOR WAGON.

THE WORD BUS
IS AN ABBREVIATION OF
THE LATIN "OMNIBUS"
MEANING:
"FOR EVERYBODY."



FRANK HAWKS
"THE JINX BUSTER"
CRUISES IN A PLANE No 13.
HIS U.S.A. DEPT. LICENSE IS NR.1313
AND THIS IS HIS 13th YEAR OF FLYING.

A 250 POUND LADY
OF YONKERS, N.Y.
DIVORCED HER
HUSBAND FOR
BUYING AN
AUSTIN CAR
Nov. 1930.



THIS TINY STEAM TRACTOR WORKS.
Took 2 Years to build and cost \$2,500.
It Generates 750/100,000^{ths} of a H.P.
on 100 lbs. of Steam.



NEWS OF THE INDUSTRY

Tractor Exports Hold Up Well

In 1930 Were
Within 5 Per Cent
of 1929 Figure

WASHINGTON, Jan. 6—Tractors comprised a larger share of United States farm machinery exports during the first 10 months of 1930 than they did during the corresponding period of 1929, the percentage increasing from 42 to 48 per cent of the total farm machinery shipments, according to the Agricultural Implement Division, Department of Commerce. During the 10-month period of 1930 tractor exports showed a decline of but 5 per cent, while the total of all farm machinery exports dropped 16 per cent.

Exports of wheel tractors during the first 10 months of 1930 amounted to 38,557 units valued at \$37,810,154 as compared to 46,830 valued at \$42,034,454 during the same period of 1929, a decrease of 17 per cent in number and 10 per cent in value, indicating that the trade in the heavier and more expensive models increased somewhat.

Exports of tracklaying tractors during the first 10 months of 1930 amounted to 4624, valued at \$10,307,712, as compared with 4838 units valued at \$8,521,749, a decrease of 4 per cent in number and 21 per cent in value.

Russia was the chief market for wheel tractors during the 1930 period, purchases increasing 128 per cent in number and 150 per cent in value. This large increase was due to heavy tractor buying by Russian interests in the first quarter.

Mercer Names Van Vechten

NEW YORK, Jan. 7—B. S. Van Vechten has been named eastern district sales manager of Mercer Motors Corp. He has been associated for more than 15 years with Dodge and recently with Chrysler.

Hudson Produces 11,208

DETROIT, Jan. 7—Hudson produced 11,208 cars since introduction new models late November, against 4180 same period last year.

The News Trailer

By Herbert Hosking

A lot of the booklets about new cars at the Show looked like time tables, what with their asterisks and daggers and things like that . . . two asterisks, meaning assist cords not included in this price, etc., etc. . . and some of them like a table d'hôte menu, with their choices of this and choices of that . . . caveat emptor . . . he's likely to find that an overlooked asterisk meant that an engine and left hind wheel were left out of the list price shown * * * inveterate booklet collectors were on deck as usual . . . Durant had a nice collectors' item in the shape of the new Mathis announcement * * * not all of the unemployed at the Show were out on 42 st. selling apples and special show issues * * * Mr. Burgess, president of Burgess Battery, thinks we are a smart aleck . . . we have also been accused of aping Walter Winchell . . . further accusations will be reported as merited * * * Alfred P. Sloan, Jr. is a southpaw . . . had you noticed * * * Durant of Canada had third place in Dominion sales for 1930 * * * last week's crack about old car names is 50 per cent true this week with the Mercer announcement herein . . . gimme about three more weeks on the second announcement * * * amateur color technicians spent lotsa time trying to figure out what color that Cord sportster job mounted besides cream . . . guesses recorded . . . tomato bisque, persimmon (Japanese), henna, rust . . . it was bought by a fire-chief from Wichita, or somewhere, about a half hour after the show opened * * * the Waffle Club met as usual * * * the spiffiest non-scheduled party was thrown by Auto-Lite * * * Scene: a Commodore elevator somewhat after midnight . . . the elevator had a hard time starting, being crowded . . . muttered the operator, "If some of you guys would park your hip flasks at the next floor we might make the twentieth" * * * the N. Y. Sun appeared to be first on the street with its special show edition * * * W. C. Durant was on deck early Saturday morning . . . helping the boys get his cars into position * * * the Willys-Overland set-out was the hardest to find.

N.A.C.C. Paves Way To Fall Announcing

New Models Will Be
Issued in November
and December

NEW YORK, Jan. 7—Directors of the National Automobile Chamber of Commerce meeting here today unanimously approved a plan for uniform dating of new model announcements, elected Alfred P. Sloan a director to fill the unexpired term of H. H. Rice and reported production for last year of 3,505,061 units.

New car announcements are to be made during November and December and the following advantages are anticipated: elimination of part of cost of tooling, no disorganization of market during heavy selling months of spring and summer, announcements come during months that are naturally slow, easier conditions for financing as insurance year ends with calendar year, increase importance of shows coming right at time of announcements and improve employment situation.

Attendance at the New York Show was reported as comparing favorably with previous years though not equal to the best.

December production based on shipping reports was 155,185 units, an increase of 15 per cent over November and 24 per cent over December last year. Approximately 561,000 cars were shipped abroad last year.

DeVaux Names Mulch

NEW YORK, Jan. 7—R. H. Mulch, formerly vice-president manager Chevrolet of Canada and sales manager for Caterpillar Tractor in Canada, has been chosen sales manager of DeVaux-Hall Motors Corp. Pacific coast, central and eastern regions have been established with George R. Morris manager of former.

Guy C. Brown Dies

DETROIT, Jan. 7—Guy C. Brown, 45 years vice-president and secretary of the Campbell-Ewald Co., died yesterday.

Hupp Produces 327

DETROIT, Jan. 7—Hupmobile December production was 327 units.

Ford Belgian Plant Occupies Large Area

Is On Reclaimed Ground Given by Antwerp

PARIS, Dec. 28 (by mail)—With a frontage on the canal open to ocean-going steamers, the new Ford factory at Antwerp, Belgium, occupies an area of 301,400 sq. ft., of which 156,700 ft. are covered. The Ford plant is a few yards away from the General Motors factory, on reclaimed ground given by the City of Antwerp. At the end of 30 years ground and buildings become the property of the city.

Owing to the loose nature of the ground, certain difficulties were experienced in building, it being necessary to put down 1019 armored concrete piles 33 ft. long and 12 in. square. Most of the building is one-story high and comprises a main hall having a frontage of 623 ft. on the canal and a width of 80 ft., equipped with a 5-ton traveling crane.

The upper floor comprises offices, garage, kitchens, restaurants for the office staff and the workers, and an exhibition hall. A tank 100 ft. above the ground level contains 110,000 gal. of city water for factory use. In the basement there is a 55,000-gal. reserve water tank, four enamel tanks having a capacity of 8000 gal., two crude oil tanks of 2200 gal., two white spirit tanks of 1100 gal. and an oil tank and a gasoline tank each of the same capacity. A traveling crane, the only one of its kind in Belgium, has been installed for loading and unloading from steamers, and the factory is connected up direct to the Belgian railway.

Goodyear Tire Declares

AKRON, Jan. 7—Goodyear Tire & Rubber Co. directors today put to rout all rumors concerning a dividend by declaring the regular payment of \$1.25 per share on common stock. Payment will be made Feb. 1 to stockholders of record Jan. 17. This is the seventh consecutive distribution on the readjusted common stock since Aug. 1, 1929.

A dividend of \$1.75 per share was also declared on the preferred stock. Payment will be made April 1 to stockholders of record March 1. Both Goodyear and Firestone have increased production schedules, which became effective last Monday. Both firms are now running nearer normal capacity. Goodyear has increased from 30,000 to 48,000 tires daily, while Firestone production has been increased about 20 per cent. Neither firm, however, is taking on outside help.

G.E. Announces New Line

NEW YORK, Jan. 7—General Electric Co. has announced a line of indicating instruments and operating elements for aircraft, operating on the resistance bridge circuit.

Morse Elects Thompson

NEW YORK, Jan. 7—F. C. Thompson, sales manager, automotive department, and manager Detroit plant, Morse Chain Co., was elected vice-president and general manager of the company at a recent meeting of the board of directors. F. L. Morse was reelected president. D. B. Perry was named second vice-president and secretary and C. J. Kenerson elected treasurer. The company has factories at Ithaca, Detroit and Lettsworth, England, and is automotive and industrial silent-chain manufacturing subsidiary of Borg-Warner Corp.

Petroleum Imports Drop

NEW YORK, Jan. 7—Imports of petroleum at the principal ports for the month of December totaled 7,568,000 bbl., a daily average of 244,129 bbl., according to the American Petroleum Institute. This compared with 8,252,000 bbl., a daily average of 275,067 bbl. for the month of November.

Imports at the principal United States ports for the week ended Jan. 3 totaled 1,838,000 bbl., a daily average of 262,571 bbl., compared with 1,989,000 bbl., a daily average of 284,142 bbl. for the week ended Dec. 27.

Average daily crude runs to stills for the week ended Jan. 3 were approximately 2,190,000 bbl., based on estimates received from 95.7 per cent of the total producing capacity reporting and 58.7 per cent operation.

N.S.P.A. Adds Finance Service

DETROIT, Jan. 5—National Standard Parts Association has announced the addition of a finance service department, the services of which, it is stated, will lend considerable assistance to the immediate development of the newly created maintenance division. For jobber members who desire to avail themselves of this new service N.S.P.A. will assist in contacting an independent finance, discount or local loan company, for the reason that they are thoroughly schooled in the finance business and credits of this nature, and have resources to handle a continued increase in volume.

H. H. Rice Leaves General Motors Corp.

Sloan Replaces Him as N.A.C.C. Director

NEW YORK, Jan. 7—Announcement of the resignation of H. H. Rice as assistant to the president, General Motors Corp., and as a director of the National Automobile Chamber of Commerce, was made this week. Mr. Rice made no statement of his future plans, and it is not known whether he will continue his many connections with the work of furthering legislation and highway activity beneficial to the automotive industries.

H. H. Rice has been connected with the automobile industry almost from its inception. He began his career with the old Pope-Hartford organization. Later he was sales manager of the Nordyke and Marmon Co. The presidency of the Cadillac Motor Car Co., a vice-presidency of the General Motors Corp., and his last connection as staff assistant to Alfred P. Sloan, are a few of the more important outlets for his activity, which he has held at various times in his career.

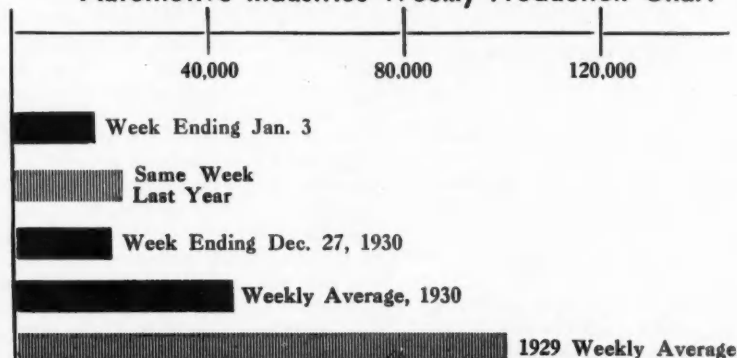
His personal interests in highway construction promotion and legislation have made him widely known throughout the United States and Europe. His activities in these directions brought him a host of official connections in organizations more or less directly attached to the automobile industry.

Mr. Rice was chairman of the legislative committee of the N.A.C.C. when he resigned.

Chevrolet Doubles Sales

NEW YORK, Jan. 7—New Chevrolet car and truck sales of 46,753 in December, 1930, were twice as many as that of any previous December, according to H. J. Klingler, speaking to the Chevrolet dealers at the annual banquet in the Commodore Hotel Wednesday night. He made a strong plea to dealers to trade on a sound basis even though sales may suffer, saying, "Hold used car bidding where it belongs and let volume come where it will."

Automotive Industries Weekly Production Chart



Oakland - Pontiac Lines Are Priced

Former Drops Two Open Body Styles

NEW YORK, Jan. 5—Factory base prices on the Oakland and Pontiac lines for 1931 were announced today at the opening of the National Automobile Show. Delivered (a.y.d.) prices will be advertised in territorial newspaper copy, as announced last week in *Automotive Industries*. The base prices follow:

Oakland

Sport coupe	\$975
Standard coupe	895
Convertible coupe	995
Sedan (2-door)	895
Sedan (4-door)	995
Custom sedan	1,055

On the Oakland line the convertible coupe replaces the model formerly listed as convertible cabriolet. The sport roadster and phaeton have been dropped, reducing the number of body types offered from eight to six.

Pontiac

Coupe	\$675
Sport coupe	715
Convertible coupe	745
Sedan (2-door)	675
Sedan (4-door)	745
Custom sedan	785

In the Pontiac line the convertible coupe replaces the type formerly known as cabriolet. Six body types are continued as in previous lines.

Pierce Trucks Priced

NEW YORK, Jan. 3—List prices on the new Pierce-Arrow truck line are as follows:

Model	Wheelbase (inches)	*Capacity (tons)	V. G. W. (Lb.)	Price
PT-1	160	12,000	12,000	\$2,950
PT-2	180	12,000	12,000	3,000
PT-3	200	12,000	12,000	3,050
PW-1	150	18,000	18,000	4,150
PW-2	170	18,000	18,000	4,200
PW-3	190	18,000	18,000	4,250
PY-1	160	28,000	28,000	5,950
PY-2	180	28,000	28,000	6,000
PY-3	200	28,000	28,000	6,050
PZ-1	168	34,000	34,000	6,950
PZ-2	204	34,000	34,000	7,000

* Capacity for licensing purposes.
† Vehicle gross weight.

Many Maryland Cars Tagless

BALTIMORE, MD., Jan. 6—More than 100,000 motor vehicles in Maryland remained without 1931 license tags on Jan. 5. Col. E. Austin Baughman, State Motor Vehicle Commissioner, said that about 228,000 sets of markers have been issued out of a total of 335,000. During the first five days of the new year 8500 tags were issued.

There is no extension of time during which old licenses can be used in Maryland and the cars without 1931 markers are prohibited from using the highways of the state.

Marmon 16 On Feb. Lines

NEW YORK, Jan. 6—The Marmon 16-cylinder car will be in production by the end of February, according to George C. Tenney, general director of sales of the Marmon Motor Car Co.

N.A.C.C. Welcomes International Visitors To New York Show With Varied Program

NEW YORK, Jan. 6—Approximately 100 American representatives of the American export trade and guests from the overseas markets were in attendance at the international session held in conjunction with the New York automobile show at the National Automobile Chamber of Commerce here yesterday. Robert C. Graham, chairman of the export committee of the N.A.C.C., presided and speakers, representing the American trade and industry, included Ernest N. Smith, general manager of the American Automobile Association; H. H. Rice, chairman of the legislative committee of the N.A.C.C.; Roy D. Chapin, chairman of the highway committee of the N.A.C.C., and C. A. Vane, general manager of the National Automobile Dealers Association.

Mr. Smith pointed out how automobile clubs can no longer be merely social clubs but must interest themselves in constructive legislation and in the defeat of proposed oppressive legislation, such as burdensome taxes.

Mr. Rice spoke of the tendency in this country to tax the automobile and emphasized the need of assuring that all revenues raised from automobile taxation be used in highway construction and maintenance. He also mentioned the present tendency toward financial responsibility laws in this country and the progress which has been made in securing uniform traffic codes.

Emil Salmson, Nash distributor for Sweden, president of the Automobile Dealers Association of Sweden and vice-president of the Royal Automobile Club of Sweden, discussed the Swedish tax situation and mentioned that the dealers' association has been rather successful in establishing definite used car values. As opposed to the attitude assumed by many Americans, Mr. Salmson favors compulsory insurance.

Mr. Chapin reviewed for the benefit of those present the activities of the recent International Road Congress in Washington and urged the overseas guests present to get in touch with the engineers from their countries who were in attendance at that congress. Mr. Chapin pointed out that there was a wide misapprehension abroad that American good roads were the result of America's wealth. This, he said, was incorrect inasmuch as the good roads are very largely a contributing factor in America's wealth.

F. A. Kettaneh, automotive distributor of Beirut, Syria, discussed economic conditions in the Near East and outlined the history of road building in Syria, Iraq and Persia.

Mr. Vane, after analyzing the troubles of the American dealer, set forth a number of rules which he believes would be of assistance to American dealers in meeting their problems and should prove equally valuable to overseas dealers.

Eugene Prince, director of Commercial Investment Trust Co. of Germany, described for the benefit of the Americans financing operations as carried on in many European countries.

Greetings were also extended by J. H. Chambers, one-time engineer and designer of the Vauxhall in England and later manufacturer of the Chambers motor car in Belfast, Ireland, and by W. Ledyard Mitchell, chairman of the board of Chrysler Export Corp.

Davis Leaves Cadillac

William N. Davis has resigned as chief body engineer of the Cadillac Motor Car Co., effective Dec. 31, to take an active part in the business of the Davis Tool & Engineering Co. of Detroit, of which firm he has been a silent partner, with his brothers, for a number of years.

C. O. Richards, for several years assistant body engineer, succeeds Mr. Davis.

Twenty years ago Mr. Davis joined Cadillac as a designer in the tool design department.

ment and a portion of the foundry machine shop will begin operations at the Rouge plant. Other production departments will resume Monday, Jan. 12.

Buick Adds 1500 Workers

FLINT, MICH., Jan. 5—Fifteen hundred more men were employed at the Buick Motor Co. today. This number, added to the 4500 who returned right after the new year, makes a total of 6000 to go to work since the holidays. The total employed at Buick is now slightly over 10,000. This includes personnel of all types.

Roughly figured this is a little over half the number employed during the peak period of a year ago for at that time the total employed was around 18,000.

Racing Prizes Pooled

PARIS, Dec. 23 (by mail)—Sixteen thousand dollars have been united as prizes for the European racing championship which will be decided on the results of the four national races to be held next year by the automobile clubs of France, Italy, Belgium and Spain. The winner of the championship will receive \$6,000, and the four following respectively \$4,000, \$3,000, \$2,000 and \$1,000.

The French race will be held on Montlhéry track, near Paris, June 21. Belgium will hold its race on the road July 12; the Italian event will be a track race at Monza, Sept. 6, and the Spanish race will be held on the road near San Sebastian Oct. 4. Rules for these races have not yet been published, but probably they will be free for all. The only condition at present common to all four events is that they shall be of 10 hours' duration.

Ten Italian Seaplanes Land 40 Men in Brazil In Test of Protracted Squadron Formation

PHILADELPHIA, Jan. 7.—Ten of the twelve Italian seaplanes which left Bolama in West Africa yesterday morning under the command of the Italian Minister of Air, Italo Balbo, landed safely at Natal, Brazil, between 4.15 and 4.30 in the afternoon of the same day, having accomplished the flight of 1875 miles in between 17 and 18 hours. Each of the planes carried four men. The two which did not reach their destination came down at sea, one shortly after the start, the other not far from its destination, but both were picked up by Italian war vessels, of which a dozen had been strung across the ocean as a precautionary measure. The flight began on Dec. 17, when 14 ships took off from Orbetello, Italy, two of these being repair and replacement units which went as far as Bolama in West Africa. Each plane carried two pilots, a mechanic and a radio operator. General Balbo had expressed the hope that he would get at least one-half of the ships safely across the ocean, and he was highly elated at the success of the enterprise.

PARIS, Dec. 23 (*by mail*)—The Savoia-Marchetti S-55-A seaplane, the machine used for the flight of the Italian Air Squadron across the southern Atlantic Ocean to Brazil, is a development of the S-55, the famous "Santa Maria." It is a trapezoidal monoplane of considerable wing thickness, tapering toward the tips, and having a span of 78 ft. 9 in. On top of the central portion of the wings is the engine trestle and below, in the leading edge, are the twin control posts for the two pilots. The wing structure is built up of three longitudinal members with compensating cross bracing which forms watertight compartments that alone are sufficient to keep the machine afloat.

Under the wings are two profiled hulls which on the commercial planes are used for passengers, but for the trans-Atlantic flight are made use of for oil and gasoline, thus supplementing the supply in the wings. The hulls are not carried back to the tails, but are connected to them by struts. The tail consists of a fixed tail plane with elevator and two drift planes with direction rudders. A third direction rudder is placed between the other two. All controls are dual and independent. The overall length is 55 ft.; height, 16 ft. 5 in.; carrying surface, 1000 sq. ft.; useful load, 9900 lb.; maximum load, 11,220 lb., and cruising speed at low altitudes, with normal load, 105 m.p.h.

Two Fiat 12-cylinder A-22-R engines, mounted in tandem, are used on each of the seaplanes. The Fiat A-22-R is a development of the same firm's A-22-T, from which it differs principally in having reducing gears.

The engine is a 12-cylinder V-type, with two banks of cylinders at 60 deg., having a bore and stroke of 5.3 by 6.29 in. which gives a piston displacement of 1703 cu. in.

The cylinders are made of steel, with integral heads and welded-on sheet-steel water jackets. The crankshaft has eight bearings, seven of these being plain and the eighth, in front, of the roller type. Two camshafts contained in an aluminum housing along the cylinder heads operate four valves per cylinder. Each pair of valves is operated by a bridge piece from one cam. Timing gear and all accessories are at the rear. Ignition is by two independent magnetos, there being two plugs in each cylinder head.

All the electrical equipment is completely enclosed and protected by metallic sheathing. Three pumps assure lubrication, one of these delivering oil under pressure to the bearings, the two others scavenging the crank chamber. The carburetors are between the two banks of cylinders and consist of two Fiat dual instruments with water-heated manifolds and altitude controls. A single radiator is used for the two engines mounted in tandem; it is, however, divided into two elements, each of which takes care of a single engine.

Motor Stocks Dropped 23.6 Per Cent in 1930

Decline Was Less Than
Average for 100 Industrials

NEW YORK, Jan. 6.—Seven leading automobile securities decreased in value on the New York Stock Exchange \$577,097,000, or 23.6 per cent, during the year 1930, according to a survey just completed by Frazier Jelke & Co., bankers.

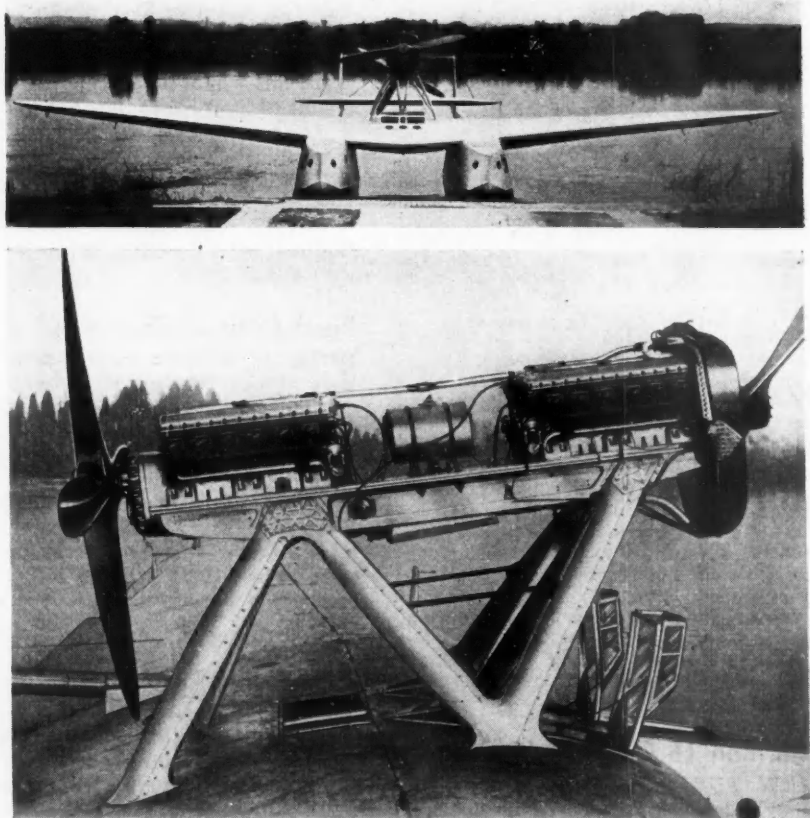
Stocks of all classifications decreased during the year resulting in a total decrease of 100 representative stocks, chosen from various groups, of \$8,700,190,000 or 29.5 per cent, during the year. The largest decline is in mines, which dropped 57.1 per cent, and the smallest decline in foods, which dropped 6.6 per cent.

Groups depreciating in value more than motors include oils, 42 per cent; equipment, 40.9 per cent; retail stores, 38.4 per cent; amusements, 36.9 per cent; electrical manufacturing, 29.6 per cent; chemicals, 29.4 per cent; rails, 24.5 per cent and a group of 14 miscellaneous industrials 24.4 per cent.

Groups declining in value less than motors include steels 20.9 per cent and utilities 18.6 per cent. In 1929 the decline in the automobile group contributed 96 per cent to the total depression and in 1930 it contributed only 6.6 per cent, while oils contributed 21 per cent to the total change.

Delco Combines Units

ROCHESTER, N. Y., Jan. 10.—The North East Appliance Corp., manufacturers of automotive electrical equipment, and the Delco-Light Co. have consolidated their activities, which are now carried on under the name of the Delco Appliance Corp. The Delco Appliance Corp. is a subsidiary of General Motors.



Upper view is front end of one of the Savoia-Marchetti seaplanes used in the Italian trans-Atlantic expedition. Lower view shows detail of unusual tandem mounting of water-cooled Fiat engines

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for *Automotive Industries*

NEW YORK, Jan. 7—General business last week was very slow as a result of the year-end inventory period. As the new year begins, definite predictions regarding an upturn in business are noticeably scarce, but on the whole optimism appears as the underlying tone of the vast majority of authoritative opinions.

GUARANTY INDEX

The Guaranty Trust Co.'s business index for November stood at 63.9, as compared with 68.1 for the preceding month and 91.1 a year ago.

COMMERCIAL FAILURES

Commercial failures during December, according to R. G. Dun & Co., numbered 2525, the highest on record. The liabilities involved in the December failures totaled \$83,683,361, marking a new high level for that month which was exceeded only in March, 1924.

HOLIDAY TRADE

Holiday trade of department stores in New York, according to the Federal Reserve Bank of New York, was 4½ per cent below that in 1929. An estimate based on practically complete data places the value of sales of these stores during 1930 at 2½ per cent below that in the preceding year. Inasmuch as the price levels during 1930 declined, the shrinkage in the volume of business was undoubtedly very small.

CAR LOADINGS

Railway freight loadings during the week ended Dec. 20 totaled 713,810 cars, which marks a decrease of 128,965 cars below those in the corresponding week last year and a decrease of 186,810 cars below those in the corresponding week in 1928.

CRUDE OIL OUTPUT

Average daily crude oil production for the week ended Dec. 27 amounted to 2,126,750 barrels, the lowest since the week ended July 31, 1926, as against 2,202,200 barrels for the preceding week and 2,607,700 barrels a year ago.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Jan. 4 stood at 78.5, as against 79.0 the week before and 79.4 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Dec. 31 were 13 per cent below those a year ago.

STOCK MARKET

The stock market last week opened with considerable softness, but the sharp turn for the better on Tuesday continued throughout the remainder of that period. Trading was on a moderate scale, and in most cases prices showed net gains for the week. Year-end factors drove call money up to 4 per cent in the earlier part of the week, but on Wednesday and Friday the rate ranged from 1½ to 3 per cent.

BROKERS' LOANS

Brokers' loans in New York City during the week ended Dec. 31 increased \$6,000,000, which is a relatively unimportant change in view of the large deflation of these loans in the preceding several weeks.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended Dec. 31 showed a decrease of \$197,000,000 in holdings of discounted bills, while there were increases of \$104,000,000 in holdings of bills bought in the open market and of \$87,000,000 in holdings of Government securities. The reserve ratio on Dec. 31 was 73.7 per cent, as against 73.0 per cent a week earlier and 75.8 per cent two weeks earlier.

Captain Campbell's Racing Car Completed; Will Be Shipped to U. S. for Speed Trials

LONDON, Jan. 7 (by cable)—Captain Malcolm Campbell's new racing car, which is to make record trials at Daytona Beach, Florida, was completed over the week end. It will be shipped from England on the *Homeric*, which sails on Jan. 14, and it is likely that Captain Campbell will sail by the same boat. An inspection of the racer today revealed that the car is fundamentally the same as Campbell's 1928 Daytona racer, which raised the record to 207 m.p.h., but the new supercharged engine develops 1450 instead of 950 hp. and the cranked rear axle permits of lower seating and a lower body, which in turn should reduce the head resistance. It should develop a speed of 250 m.p.h.

The engine is of the Napier 12-cylinder airplane type, in which the cylinders are arranged in three rows of four, one bank being vertical and the other two inclined. The bore and stroke are 5½ and 5½ in. respectively, and 1450 hp. is developed at 3600 r.p.m. The weight of the engine is 1140 lb., which is equivalent to approximately ¾ lb. p. hp.

Three speeds are provided by a constant-mesh type of transmission, and the drive to the rear axle is by a single propeller shaft. As in Segrave's *Golden Arrow*, the steering is duplicated, with separate linkage to each of the front wheels. Half-elliptic underslung springs are used for and aft; brake torque reaction is taken by a central torque member anchored at the front to a tubular cross-member of the frame.

The car with its body and streamlined shell will weight approximately 5600 lb. The shell is being built very low, and the top of the driver's head will be only 45 in. from the ground. Exhaustive wind tunnel tests have given rise to optimism in regard to the likelihood of the record of 231 m.p.h. being decisively beaten. The overall length of the car will be 25½ ft.



Captain Malcolm Campbell, British aspirant to the late Sir Henry Segrave's World's Speed Record, is shown standing in the numerical center of the group of men responsible for the construction and condition of his new 1450 hp. car.

Truck Committee Meets

NEW YORK, Jan. 7—The Motor Truck Committee of the National Automobile Chamber of Commerce met at the headquarters of the chamber yesterday and discussed the tendency toward increasing taxation on trucks and buses. Taxes on this group are already so high that they are threatening the development of highway transportation, the committee points out.

Bryce Edwards, assistant marketing specialist of the United States Department of Agriculture, discussed the principal advantages of motor truck use in hauling farm products and pointed out that for distances of more than 50 miles motor truck rates are usually higher than carlot rail rates, but because of the directness of this type of service it is still used in some of these longer hauls. Loss from perishability is negligible in truck haulage, Mr. Edwards stated.

Kari-Keen Resumes

SIOUX CITY, IOWA, Jan. 6—The Kari-Keen Mfg. Co., makers of auto luggage, etc., suspended the past 60 days, resumed operations Jan. 5 with 200 men. Imme-

diately production will be at rate of between 200 and 300 units a day, C. H. Meyers, president of the company, announced. Normal capacity is 1000 trunks a day.

Charles R. Clarke Dies

YORK, PA., Jan. 5—Charles R. Clarke, vice-president of the Self-Lift Jack Corp., was found dead at his residence Sunday morning. The Jan. 3 issue of *Automotive Industries* carried the announcement that Mr. Clarke, as general manager of the corporation, would open a York plant for the manufacture of hydraulic automobile jacks. No announcement of a successor to take Mr. Clarke's place as organizer has been announced.

Cadillac Presents Awards

DETROIT, Jan. 5—More than 1000 employees of the Cadillac Motor Car Co. were presented awards in 1930 by Lawrence P. Fisher, president, for continuous service for five and 10 years respectively.

Car Trends Described to Met. Section; Marmon Receives the Moskovics Medal

NEW YORK, Jan. 6—One of the largest attendances for a section meeting turned out to hear Harry L. Horning, past-president of the Society of Automotive Engineers and president of Waukesha Motor Co.; Athel F. Denham, field editor of *Automotive Industries*, and O. T. Kreusser, of Fisher Body Corp., discuss the new developments and trends in design in automobiles, at the annual automobile show dinner of the Metropolitan section of the Society. Mr. Horning discussed developments in engines, Mr. Denham those in chassis while Mr. Kreusser subjected automobile bodies to a critical analysis.

A high light of the evening was the announcement of the award of a medal for the outstanding engineering design of 1930 to Howard C. Marmon, for his company's sixteen-cylinder car. The medal, which is to be presented annually by the Metropolitan Section, is the offering of Fredrick E. Moskovics, formerly president of the Stutz Motor Car Co.

To a committee, consisting of Col. W. G. Wall, past-president of the Society; T. J. Litle, chief engineer, Holley Carburetor Co., also a past-president; Myron B. Pope, editor *Automobile Topics*, and T. C. Smith of the American Telephone & Telegraph Co., together with Mr. Moskovics, was assigned the task of selecting the recipient.

The official title of the medal is "The Metropolitan Section, Society of Automotive Engineers Medal, for the individual responsible for some outstanding improvement in some branch of the American passenger car industry."

Among the most important developments in engines listed by Mr. Horning were carburetor intake silencers, improvement in vibration dampers, improvements in rubber engine mountings, increased horsepower, generally; improvements in combustion chamber design, developments in both cast iron and aluminum alloy pistons, improved valves and valve spring design, and the attention given to oil cooling. Mr. Horning also discussed the question of "How Many Bearings for a Six," advocating the use of a smaller number of bearings, due to the chatter he states is set up by the necessarily narrower bearings when more of them are used. Mr. Horning stated that it is virtually impossible or at least extremely difficult to lubricate properly

ly a bearing less than 1½ in. in width.

Mr. Denham in his summary of passenger car chassis developments emphasized the large amount of attention concentrated on the transmission this year. Chassis detail designs adopted by a number of manufacturers this year and therefore possibly indicating trends in design as given by Mr. Denham included the following:

Synchromesh transmissions . . . found on six makes and 14 chassis.

Free wheeling . . . found on five makes and 15 chassis models.

Automatic chassis lubrication . . . three makes and seven chassis.

Double drop frames . . . use increased by nine makes and 17 chassis.

Wide rear tread . . . six more makes have 58 in. or larger tread.

Single braking system . . . six more makes than last year.

Longer wheelbase . . . increased on 11 makes, representing 17 chassis.

Wire wheels, standard equipment . . . ten more makes come with 5 wire wheels.

Mr. Denham ascribed the recent developments in transmissions to two factors, the desire for easier shifting, and for decreased noise, and pointed out how this end was made possible in different manners by either free wheeling, or synchronizing clutches, or by dog clutches. He pointed out that in all of these designs, the fundamental requirement was the provision of constant mesh gears for next-to-high engagement. The widespread use of helical gears for quiet transmissions was also pointed out by Mr. Denham.

Among the rather important general developments during the past year in body design, Mr. Kreusser pointed out the slanting non-glare windshield, the use of insulating material for the bodies to keep out heat, cold and noise, and the coming back into favor of the convertible car. The latter, Mr. Kreusser felt, was not due to any startling developments in design, but rather a returning desire on the part of the public for this type of body. Mr. Kreusser also criticized the present automobiles and suggested attention to a number of details, such as the method of hanging front doors so as to obtain narrow front pillars, with strong front ends, and the provision of compartments or pockets for "knick-knacks" on the lower priced as well as the high priced cars, on which they are now found in larger numbers.

Overland Has 2 Trucks

NEW YORK, Jan. 5—In connection with its new passenger cars shown at New York Willys-Overland announced two new truck models, the Model C 113, a half-ton type on a 113-in. wheelbase, listing at \$395; and the Model C 131, a 1½-ton type on a 131-in. wheelbase, listing at \$595. It was explained in connection with the announcement that these two truck models are the only ones now ready for production.

Rubber Association Reelects Woolner

Bulkley and Seiberling
Speakers at Banquet

NEW YORK, Jan. 6—Samuel Woolner, Jr., president of Kelly-Springfield Tire Co., was reelected president of the Rubber Manufacturers Association at the regular annual meeting held here yesterday, along with the entire existing group of officers and directors.

J. D. Tew, B. F. Goodrich Co., remains first vice-president, C. D. Garretson, Electric Hose & Rubber Co., second vice-president, H. B. Delapierre, Kelly-Springfield Tire Co., assistant treasurer, and A. L. Viles, general manager. A. F. Townsend, president of Manhattan Rubber Co. Division of Raybestos-Manhattan, Inc., was elected to the board of directors to succeed W. L. Pfeiffer, formerly of Miller Rubber Co. Other directors were re-elected.

President Woolner, in acting as toastmaster, at the end of the banquet held in the evening, condemned a number of practices which have been followed during the past year by the industry in its competition for business and expressed regret that no constructive foundation has yet been laid to remedy these practices.

The speakers of the evening were: Hon. Robert J. Bulkley, United States Senator from Ohio, who after outlining his views on prohibition and the present business depression expressed the need for some modification of the Sherman anti-trust law in order that manufacturers may prevent the recurrence of such overproduction and cut-throat type of competition as has been followed during the past year.

Hon. Francis Seiberling, congressman from the Akron District of Ohio, also spoke and he brought out even more clearly than Senator Bulkley the imperative need for modification under present economic development of the Sherman act.

Oakland to Pick "Leaders"

NEW YORK, Jan. 5—Creation of "Oakland Leaders," an honorary organization within the company, was announced to Oakland and Pontiac dealers at the annual meeting at the Hotel Pennsylvania, by W. R. Huber, sales promotion manager.

To qualify for membership in "Oakland Leaders," dealers will meet certain standards of net profits in their operations. Salesmen and service men will have similar standards set for their sales efforts, which when met will entitle them to membership.

From among the dealer members of "Oakland Leaders" will be selected each month a group of 12 which will visit the factory and discuss with executives and members of the board questions of interest to dealers generally.

Chevrolet Adds 3 Types

NEW YORK, Jan. 5—Chevrolet had three new body types at the New York show. The additions to the line consist of a convertible cabriolet at \$615, a five-passenger coupe at \$595 and a landau phaeton at \$650.

DuPont Schedule 200

NEW YORK, Jan. 5—DuPont Motors, Inc., expects to produce 200 cars this year. The 1929 production was approximately 175 and that of 1930 was 125.



H. L. Horning



A. F. Denham

Electrical Men Hear Graham Praise Selling

Says Lessons of Depression
Will Help When Upturn Comes

NEW YORK, Jan. 6—"Sell Now." This was the formula for ending the slump given by George M. Graham, vice-president of Willys-Overland, in his talk before the Automotive Electric Association at the annual luncheon of the association at the Hotel Astor.

Mr. Graham, the featured speaker, continued: "This is the golden age of the salesman. Millions of people have money to spend. Only the salesman can hunt them out. When he does the depression will be over.

"When will that be? You know more about that than I do. You, as retailers, will be the first to feel the upturn. And when the upturn does come, there will be that inevitable period when volume will run ahead of the costs you have learned to control during the depression. In this period when volume is mounting you will be able to recoup in six months the losses of two years of slumping sales."

Dan Kelly, vice-president of Electric Auto-Lite, also addressed the gathering, promising good business for 1931 but warning against excess optimism that can so easily result in disappointment.

F. A. Oberhu, president of United Motors Service, in his talk urged members to strive continuously for greater recognition in the trade. Only by convincing the public and manufacturers that theirs is the rightful source of specialized service can they attain the greatest success, he added.

Earl Turner, manager of the association, closed with a short talk in which he promised greater association activity during the coming year.

Hudson Offers Options

NEW YORK, Jan. 5—Hudson and Essex prices on models, shown at New York, showed no change from those previously reported in *Automotive Industries*. With a few exceptions, all models from the factory will carry as standard equipment the following accessories: chromium-plated radiator grille, hydraulic shock absorbers, engine heat indicator on dash, gasoline cleaner, air cleaner, automatic windshield wiper, rear view mirror, electric gasoline gage, shade, smoking companion, assist cords, stop light, Alemite lubrication, double cowl ventilators, cowl lights, speedometer, rear tire carrier and spare rim.

In addition to these items, five options concerning wire wheels and fender wells are available. Each option is explained to the purchaser in detail, under headings labeled A to E.

Marmon Prices Eights

NEW YORK, Jan. 5—The following prices were announced by the Marmon Motor Car Co. on its two eight-cylinder lines:

Series 70	
2-pass. coupe	\$ 950
5-pass. sedan	995
4-pass. victoria coupe	995
Convertible coupe	1045
Series 88—130-in. Wheelbase	
2-pass. coupe	\$2275
5-pass. sedan	2295
2-pass. convertible coupe	2395
5-pass. club sedan	2345
Series 88—136-in. Wheelbase	
7-pass sedan	\$2495
7-pass. limousine	2595

Daily Average Gasoline Consumption In October Fell Off 7.7 Per Cent

NEW YORK, Jan. 5—Gasoline consumption in 46 states and the District of Columbia for the month of October, 1930, as indicated by reports made by wholesalers and dealers in the various states under provisions of the gasoline tax laws or gasoline inspection laws, totaled 1,198,068,000 gal., compared with 1,178,970,000 gal. in October, 1929, an increase of 19,098,000 gal. or 1.6 per cent. Daily average consumption for October, 1930, was 38,647,000 gal., compared with a daily average of 41,868,000 gal. in September, 1930, a decrease in daily average during October of 7.7 per cent.

Gasoline consumption in 44 states and the District of Columbia for the 10 months ending with October, 1930 (Illinois and New York not included), amounted to 9,311,266,000 gal., compared with 8,783,575,000 gal. for the corresponding period of 1929, an increase of 527,691,000 gal., or 6.0 per cent.

All figures are subject to revision.

Gasoline Consumption by States, October, 1930

	Tax Per Gallon Cents	Month of			10 Months Ending With	
		Sept., 1930 Gallons	Oct., 1930 Gallons	Oct., 1929 Gallons	Oct., 1930 Gallons	Oct., 1929 Gallons
Alabama	4	14,675,000	14,906,000	16,858,000	146,109,000	150,465,000
Arizona	4	6,276,000	6,335,000	6,464,000	63,434,000	59,299,000
Arkansas	5	12,765,000	12,780,000	13,417,000	118,396,000	113,143,000
Colorado	4	16,693,000	14,930,000	14,086,000	147,576,000	134,472,000
Connecticut	2	20,508,000	20,225,000	18,835,000	188,541,000	170,336,000
Delaware	3	3,361,000	3,225,000	3,201,000	30,674,000	27,670,000
Dist. of Col.	2	6,946,000	7,403,000	6,473,000	66,265,000	60,063,000
Florida	6	16,348,000	17,490,000	17,000,000	187,853,000	184,994,000
Georgia	6	19,799,000	19,554,000	20,459,000	188,501,000	183,581,000
Idaho	5	6,790,000	5,953,000	5,903,000	52,852,000	46,162,000
Illinois	3	89,282,000	87,485,000	83,211,000	.....	.....
Indiana	4	42,647,000	42,423,000	40,167,000	338,676,000	368,623,000
Iowa	3	37,572,000	35,592,000	33,684,000	332,945,000	283,716,000
Kansas	3	36,039,000	29,387,000	30,126,000	331,675,000	310,351,000
Kentucky	5	15,624,000	15,426,000	14,867,000	141,682,000	130,695,000
Louisiana	4	15,919,000	16,362,000	17,145,000	153,033,000	147,416,000
Maine	4	12,623,000	11,049,000	10,208,000	92,872,000	82,867,000
Maryland	4	16,635,000	16,171,000	15,313,000	146,552,000	137,224,000
Massachusetts	2	50,390,000	47,696,000	47,786,000	452,232,000	425,315,000
Michigan	3	73,776,000	70,424,000	72,128,000	672,281,000	668,021,000
Minnesota	3	41,227,000	37,726,000	36,960,000	342,801,000	307,062,000
Mississippi	5	*11,740,000	*11,925,000	13,384,000	*117,041,000	119,461,000
Missouri	2	40,516,000	40,152,000	37,596,000	367,348,000	329,674,000
Montana	5	10,486,000	7,370,000	7,805,000	72,379,000	67,670,000
Nebraska	4	21,222,000	19,730,000	19,694,000	193,440,000	194,109,000
Nevada	4	1,889,000	1,633,000	1,656,000	15,850,000	14,945,000
New Hampshire	4	6,998,000	6,020,000	5,750,000	55,918,000	50,337,000
New Jersey...	2	50,050,000	48,690,000	44,329,000	459,188,000	420,589,000
New Mexico	5	5,154,000	4,864,000	4,219,000	45,767,000	37,671,000
New York	2	142,343,000	136,503,000	126,971,000	.....	.....
North Carolina	5	22,806,000	22,563,000	25,242,000	206,344,000	214,756,000
North Dakota	3	14,290,000	10,329,000	12,830,000	108,379,000	114,834,000
Ohio	4	81,084,000	82,762,000	87,624,000	822,108,000	808,957,000
Oklahoma	4	30,149,000	27,196,000	28,620,000	273,551,000	264,131,000
Oregon	4	16,779,000	15,197,000	15,061,000	145,530,000	137,082,000
Rhode Island	2	8,266,000	8,173,000	6,899,000	74,341,000	65,641,000
South Carolina	0	10,724,000	10,815,000	10,291,000	99,360,000	97,994,000
South Dakota	4	14,393,000	11,520,000	12,388,000	119,763,000	107,764,000
Tennessee	5	20,090,000	20,750,000	18,161,000	181,830,000	162,158,000
Texas	4	72,707,000	66,319,000	68,663,000	670,195,000	639,806,000
Utah	3½	5,464,000	5,320,000	5,332,000	51,898,000	47,863,000
Vermont	4	5,334,000	4,799,000	4,592,000	40,142,000	37,889,000
Virginia	5	20,738,000	22,348,000	19,523,000	192,058,000	174,084,000
Washington	3	25,759,000	22,560,000	22,998,000	230,657,000	214,024,000
West Virginia	4	14,561,000	13,663,000	12,660,000	118,336,000	106,885,000
Wisconsin	2	42,898,000	41,187,000	39,130,000	373,395,000	333,593,000
Wyoming	4	3,690,000	3,138,000	3,261,000	31,497,000	30,183,000
Total		1,256,025,000	1,198,068,000	1,178,970,000	9,311,266,000	8,783,575,000
Daily Average		41,868,000	38,647,000	38,031,000	30,629,000	28,893,000
Increase over previous year:						
Amount of Increase			19,098,000	.....	527,691,000	.....
Percentage Increase in Daily Average			1.6%	.....	6.0%	.....

* Estimated.

Trucks Help Development

WASHINGTON, Jan. 6—The motor truck and bus are playing a significant part in the transportation system and general economic development of the Pacific Southwest, it is brought out in a report of the U. S. Commerce Department covering a general commercial survey of this area recently completed by the department's experts.

A total of 250,706 motor trucks were in operation in the five southwestern states of Arizona, California, New Mexico, Nevada and Utah in 1929, the report shows, in addition to

buses and passenger automobiles turned to commercial use. These vehicles serve the dual purpose of supplementing the older forms of transportation in the more populous regions and furnishing to numerous outlying communities their only means of transportation connection with the outside world.

Over some areas as large as such eastern states as Maryland and Massachusetts motor trucks are the sole means of commercial transportation. Yet the development of motor services is such that it may be said that no place is too remote to have some motor-driven vehicle operating for hire.

Pierce-Arrow Set Goal of 12,000

Chanter Warns Against Too Much Caution in 1931

NEW YORK, Jan. 5—In what A. J. Chanter, vice-president and general manager, described as the final huddle before going into the 1931 automotive scrimmage, Pierce-Arrow distributors, dealers and salesmen were urged to get away from over-cautiousness, forget what happened in 1930 and pitch into 1931 with the determination to sell 12,000 cars, an objective set by President A. R. Erskine.

"The biggest danger in 1931," said Mr. Chanter after the company's guests had been feasted and entertained in the Plaza Hotel ballroom, "is that the 1931 sales effort may be marked by over-cautiousness, over-conservatism. I don't advocate a program of recklessness, but over-cautiousness will cause as many losses and cost as much money as recklessness. The industry—the country—suffered from over-cautiousness in 1930."

The company, Mr. Chanter pointed out, had set a good example by bringing out the present new line at this time instead of next fall as originally intended.

George E. Willis, vice-president in charge of sales, said that the company had strengthened its position in 1930 by increasing its dealer organization 20 per cent. The company now has three times as many dealers as two years ago. He declared 1931 would be a better automobile year than 1930.

Further evidence that the company was setting an example in banishing over-cautiousness was furnished by a representative of McManus, Inc., the agency now handling the Pierce-Arrow account, who explained the nature and purposes of the greatest advertising campaign in the history of Pierce-Arrow.

President Erskine was the final speaker. After citing sales records in the fine car field for the last five years, he gave the Pierce-Arrow sales organization a 12,000-car objective in 1931.

In mentioning the new line of trucks announced by Pierce-Arrow, Mr. Erskine declared that the truck line would not be advertised in newspapers, and that in appearance the trucks would not imitate the passenger cars, which, if otherwise, might be a source of dissatisfaction.

Pre-Show Dinner Starts Things Going

NEW YORK, Jan. 5—The opening guns of the New York show were fired at a pre-show dinner of the Merchants Association of New York, Inc., held at the Commodore Hotel Jan. 2. Alfred Reeves, general manager of the N.A.C.C., acted as toastmaster and introduced as speakers of the evening: Knute Rockne, coach of the Notre Dame football team, and William B. Burrus of the sales promotion department of the N.A.D.A.

Among the guests of honor at the speakers' table were Alfred P. Sloan, Jr., president of General Motors Corp.; Albert R. Erskine, president of Studebaker Corp. of America; Ray Graham, secretary and treasurer of Graham-Paige Motors Corp.; Roy Faulkner, vice-president in charge of sales of Auburn Automobile Co.; John C. Boyers, president and general manager of Ward Motor Vehicle Co.; H. W. Peters, vice-president of Packard Motor Car Co.; Byron C. Foy, vice-president of Chrysler Motor Corp., and Paul G. Hoffman, vice-president of Studebaker Corp.

Shipments Expected to Drop

WASHINGTON, Jan. 8—Shipments of automobiles, trucks and parts in the first quarter of 1931 will be about 160,805 cars, according to estimates submitted to the Shippers' Regional Advisory Boards of the American Railway Association. This represents a reduction of 13.4 per cent under shipments of 185,753 cars made in the first quarter of 1930.

Graham Revises Prices; Most Types Are Lower

DETROIT, Jan. 5—Following are the prices on the 1931 Gramhams:

STANDARD SIX			
Model	Old	New	Change
Coupe	\$ 895	\$ 845	* 50
Town Sedan	845	895	* 50
Rumble Seat			
Coupe	945	895	50
Roadster	995	895	100
Sedan	895	955	* 60
SPECIAL SIX			
Coupe	\$1195	\$ 925	\$270
Rumble Seat			
Coupe	1225	975	250
Town Sedan		975	...
Sedan	1225	1035	190
SPECIAL EIGHT			
Coupe	...	1155	...
Rumble Seat			
Coupe	1595	1195	400
Sport Sedan	...	1195	...
Sedan	1795	1245	550
CUSTOM EIGHT			
5-Pass. Sedan	2025	1845	180
7-Pass. Sedan	2525	1895	630
Limousine—7-Pass.	...	2095	...

* Increase.

Revises Racing Record Rule

NEW YORK, Jan. 7—The interval permitted between record runs in opposite directions for world's record attempts at Daytona Beach was increased to one hour by the Contest Board of the American Automobile Association at a meeting here Jan. 5. This action was taken in the interest of safety so that necessary tire changes and examination of car can be completed. World record trials may be conducted on Galveston Beach and the Utah Salt Beds if investigation proves these courses suitable for straightaway runs. The Contest Board voted to accept jurisdiction of races and trials throughout Canada and Mexico.

Franklin's Position Better

NEW YORK, Jan. 6—Franklin bettered its sales position as compared with its direct competitors during 1930, John E. Williams, vice-president in charge of sales, told Franklin dealers at the annual president's luncheon held at New York, Jan. 5. B. C. Forbes voiced the opinion that the bottom of the depression is past, but that sales will come only with intensive effort in 1931. H. H. Franklin, president, attended the luncheon, as did Frederick J. Haynes, who recently became vice-president of the Franklin organization.

Crucible Has New Office

NEW YORK, Jan. 5—Crucible Steel Co. of America has erected a new warehouse and office building at 3245 Hubbard Ave., Detroit.

Nash Earnings Larger In Last Fiscal Quarter

Share Profits of Period Ended Nov. 30 Equal 77 Cts

CHICAGO, Jan. 7—Profits of the Nash Motors Co. in the three months ended Nov. 30, the final quarter of the fiscal year, were the largest of any quarter of the year, although they continued under the corresponding period of the preceding year, it was announced yesterday, coincident with the declaration of the regular quarterly dividend of \$1 a share on the capital stock.

The net income for the November quarter amounted to \$2,108,485 after all charges, or 77 cents a share on the capital stock as compared with \$1,777,270 or 65 cents a share in the preceding three months and with \$4,202,924 or \$1.54 a share in the November quarter of 1929.

For the 12 months ended Nov. 30, the net income amounted to \$7,601,614 after all charges, equal to \$2.78 a share on the 2,730,000 shares of capital stock outstanding as compared with \$18,013,781 or \$6.60 a share in the preceding fiscal year.

China Increases Tariff

WASHINGTON, Jan. 8—The new Chinese tariff, effective Jan. 1, increases the duty on motor buses and trucks to 15 per cent from 12.5 per cent ad valorem and on automobiles and parts to 30 per cent from 22.5 per cent, according to a cablegram received by the Department of Commerce from Commercial Attache Julian Arnold, Shanghai. Goods of all kinds imported from the United States are not affected seriously by increases so far reported. On the other hand, there are many decreases in duties, apparently more numerous than the increases. Goods now en route to China are exempted from increased duties.

G.M. Dealers Breakfast

NEW YORK, Jan. 5—General Motors Corp. started its show activities with a dealer breakfast at the Hotel Astor, where General Motors' private showing of automobiles is held in connection with the New York National Show.

R. H. Grant, vice-president of the corporation, addressed the salesmen, pointing out that 1931 will be a work year. Mr. Grant likened the sales of automobiles to the panning of gold and pointed out that where the pay dirt was poor the miner frequently had to pan twice as much in order to secure a given amount of gold. Analogously the automobile salesman may have to make twice as many calls this year as he has made in past years. By doing that he should easily surpass 1930 in sales volume, Mr. Grant said.

Austin Prices Reduced

NEW YORK, Jan. 5—The American Austin Car Co. announced reductions of prices on two of the three models, now in production. Comparative prices are:

	New	Old
Coupe	\$395	\$465
Del Coupe	395	465
Roadster	445	445

Musselman Sees More Car Junking

Tells N.A.D.A. Replacement Market Will Gain in 1931

NEW YORK, Jan. 5—"The market for passenger cars to replace those scrapped should show a continuous growth in 1931, and 1932 will be still a better year," C. A. Musselman, president of the Chilton Class Journal Co., publisher of *Automotive Industries*, told the eastern district convention of the National Automobile Dealers Association at a meeting held at the Hotel Commodore today, in connection with the National Automobile Show. Mr. Musselman's address followed his annual custom, established during several years, of making a sales and service forecast for the ensuing year, based on previous trends.

"Scrapping Developments of 1930" were discussed in detail at the N.A.D.A. meeting by Don Blanchard, editor of *Automobile Trade Journal*. His address was followed by a discussion of the Cleveland Salvage Plan, led by Herbert Buckman, manager of the Cleveland Automobile Manufacturers and Dealers Association. Other addresses at the morning session were by Victor Pope, Akron, and W. B. Burruss, sales counselor, New York.

At the afternoon session Edward Payton, accounting supervisor of the N.A.D.A., discussed "Quantity, Quality, and Speed Rates for Paying Salesmen," and G. W. Benedict of the Weaver Mfg. Co., "Customer Control in the Service Station."

"Problems of the Automobile Retailer" were presented by Paul G. Hoffman, vice-president, Studebaker Corp. The meeting closed with an inspirational address on the theme "America Forward March," given by the Rev. John L. Davis, D. D., of New York. More complete reports of the addresses at the meeting will appear in an early issue of *Automotive Industries*.

Durant Prices 3 Lines

NEW YORK, Jan. 5—Prices on three lines of Durant passenger cars were announced at the New York Show as follows:

Type	Model 610 New Price	Old Price
Sedan	\$765	....
Rumble coupe	755	....
Business coupe	735	....
	Model 612	
Sedan (Pullman)	795	....
Rumble coupe	780	....
Business coupe	760	....
Chauffeur sedan	825	....
	Model 614	
Sedan	995	\$845
Rumble coupe	965	815

Favors Toll Bridge Construction

NEW YORK, Jan. 6—American Engineering Council has placed itself on record as favoring the construction of toll bridges by private capital where local authorities are on record as not willing to construct a free bridge. A clause permitting recapture not sooner than 20 years after completion of the bridge is favored under these circumstances.

Mathis Will Be \$455 f.o.b.

NEW YORK, Jan. 5—The American Mathis coupe model exhibited at the New York National Automobile Show has been priced at \$455, f.o.b. factory.

EVENTS DURING CHICAGO SHOW WEEK

Chicago Auto Trade Asso., Pre-Show Dinner, Congress	Jan. 23
Pierce-Arrow, Luncheon, Stevens	Jan. 26
Franklin Mfg. Co., Luncheon, Blackstone	Jan. 26
Hupp Motor Car Co., Luncheon, Stevens	Jan. 26
Nat'l Auto. Dealers Asso., Meeting, Palmer House	Jan. 26
Studebaker Corp., Dinner, Sherman	Jan. 26
Hupp Motor Car Co., Luncheon, Stevens	Jan. 27
Federal Distributors, Meeting, Stevens	Jan. 27
Federal Distributors, Banquet, Stevens	Jan. 27
Nat'l Auto. Dealers Asso., Banquet, Commodore	Jan. 27
Auburn Automobile Co., Luncheon, Stevens	Jan. 27
Packard Motor Car Co., Luncheon, Blackstone, 12.15 noon	Jan. 27
Nat'l Asso. of Show & Asso. Mgrs., Luncheon, Palmer House, 12.30 noon	Jan. 27
Hupp Motor Car Co., Luncheon, Stevens	Jan. 28
Nat'l Auto. Chamber of Com., Directors' Meeting, Stevens	Jan. 28
Marmon Motor Car Co., Luncheon, Palmer House	Jan. 28
Olds Motor Works, Dinner, Congress	Jan. 28
Willys-Overland Co., Banquet, Palmer House	Jan. 29

Erskine Expects Big Improvement

NEW YORK, Jan. 5—Fifty-six per cent increase in Studebaker sales for 1931, as compared to 1930, was estimated as a fair quota by A. R. Erskine, president, Studebaker Corp. of America, in his talk at the Studebaker dealer dinner in the Hotel Commodore, Saturday evening, Jan. 3. Studebaker retail sales totaled about 64,000 in 1930, Mr. Erskine said, and set the 1931 goal at 100,000.

Factory production was 56,000 and factory shipments to dealers 60,000 cars in 1930, Mr. Erskine said.

Paul G. Hoffman, vice-president in charges of sales, presided and urged on the dealers the vital need for more effective management of salesmen. He placed the blame for poor salesmen squarely on the shoulders of the dealer.

Olds Offers 6 Options

NEW YORK, Jan. 5—Standard and de luxe models of the Olds line, showing no price changes from those previously announced in *Automotive Industries*, now carry six accessory options, the first three applying to the standard models and the second three to the de luxe. Accessory group 1 includes, for example, chromium-plated bumpers, front and rear, spare tire and spare wheel lock. The standard two-door sedan, listing at \$845, lists at \$882.50 with this additional equipment.

Associated Has Fire Loss

FLINT, Jan. 5—Fire last week completely destroyed the office of the Associated Die & Tool Co., 601 Water Street, Flint, Michigan, and threatened to spread through the entire factory.

The amount of damage was estimated by L. H. Gibney, manager, to be \$5,000.

Automotive Sheets In Better Demand

Strip Mills Lag As Prices Show Firm Trend

NEW YORK, Jan. 8—Amid the gradual brightening of steel market conditions, broadening of activities by automobile sheet finishing mills is the most impressive development. There remains still much room for improvement, not all of the sheet mills having so far shared in the upturn and strip mills being still a considerable distance from reassuring backlogs, but ton by ton more and more business is coming out from automotive consumers.

Moderate gains have also been made by producers of cold-finished steel bars and alloy steels. The leading "independent" full-finished automobile specialist booked last month twice as much business as in the corresponding month of the preceding year. Wall Street anticipates that the leading interest's unfilled tonnage statement for last month, to be made public Saturday noon, will reveal a substantial increase, and the steel market is inclined to agree with this expectation.

Prices have turned steady all along the line. It would be exaggerating the improvement to characterize them as strong because with an increase in steel making capacity to 68,000,000 tons the scale basically still tips in buyers' favor and is likely to continue so for some time to come, but more stable price conditions than those which prevailed a few months ago have certainly arrived. The market for semi-finished steel is now quoted at \$30, the level at which business has recently been done, although \$31 was the nominal quotation. In non-ferrous metals, a reduction in the price of lead is ascribed to heavy domestic stocks.

Pig iron—The market is steady. Automotive foundries are showing more interest, but shipping orders denote considerable conservatism. The Valley quotation for foundry iron is \$17, furnace, with Lake furnaces quoting \$16 @ \$16.50, which makes the Michigan price \$17.50.

Aluminum—No changes are to be noted in prices. Automotive demand is more active.

Copper—The leading fabricator's latest official price list is based on a 10½¢, delivered Connecticut, price for electrolytic. Demand for automotive brasses and other copper products has broadened.

Tin—Bolivia has joined the Federated Malay States, Dutch East Indies and Nigeria in their decision to fix tin export quotas for the ensuing two years. The Straits market opened the week at 26½¢, with consuming inquiry light.

Lead—The leading interest announced on Monday a cut of \$2 per ton in its official contract price, making the New York quotation 50¢.

Zinc—Dull. Prime Western quoted at 4.10¢, East St. Louis.

Dodge Models Priced

NEW YORK, Jan. 5—Prices on the new Dodge models follow:

	Six	Eight
Roadster	\$825	\$1,095
Coupe	815	....
Coupe with rumble seat	835	1,095
Convertible coupe	895	1,170
Sedan	845	1,135

Checker Cab Leases Space

NEW YORK, Jan. 6—Checker Cab Mfg. Co., through a subsidiary, Cab Service & Parts Corp., has leased 120,000 sq. ft. on four floors at 521-531 West 57th Street, for sales office, showroom, parts department, etc.

Peerless Shows Net of \$73,236 for Year

Will Dispose of One Plant in Cleveland

CLEVELAND, Jan. 5—A net profit of \$73,236 for the fiscal year ending Sept. 30, 1930, is shown in the annual report of the Peerless Motor Car Corp., submitted to stockholders this week by J. A. Bohannon, president and general manager. Seventy per cent, or \$1,702,535, of the corporation's net working capital is in cash, according to the statement.

Inventories of the corporation have been reduced 44 per cent since the period covered by the report, said Mr. Bohannon in an accompanying letter to stockholders. Sales of cars and parts for the fiscal year brought the corporation an income of \$6,478,047. Operations costs were \$6,407,409 for the period.

Plant No. 2 of the corporation, which adjoins Plant No. 1 on the main line of the Nickel Plate Railroad, and comprises about 13 acres of land, and 327,000 sq. ft. under roof, will be disposed of when the opportunity offers, according to Mr. Bohannon's report. Plant No. 2 has been made unnecessary to Peerless plants by the modernization of Plant No. 1, it was stated.

Cadillac Prices Adjusted

NEW YORK, Jan. 5—Prices on two of the three new Cadillac lines have been adjusted as follows, according to an announcement made during the New York Show:

Model 355—No change		
Model 370		
	New Price	Old Price
Roadster	\$3,945	\$3,940
Model 452		
Phaeton	6,500	6,150
A. W. Phaeton	5,750	6,650
Town cab	6,525	7,000
Town cab	8,750	7,150
Lim. Bro'm	6,525	7,150

Materials' Index Lower

NEW YORK, Jan. 5—The price index of raw material used in the automotive industries, compiled by Ray B. Prescott, stood at 99 in the middle of November, as compared with 100 in the middle of the preceding month, and with 120 for November, 1929. The Bradstreet index of general raw material prices for November, 1930, was 110.

Chrysler Six Priced

NEW YORK, Jan. 5—Prices on the new Chrysler Six follow:

5-pas. sedan	\$895
Coupe with rumble seat	885
Roadster with rumble seat	885

These prices include five wire wheels or four wood wheels with spare rim.

Willys Signs 15 Dealers

TOLEDO, Jan. 5—Fifteen new dealerships have recently been added by Willys-Overland, Inc., according to an announcement from the factory.

+ + CALENDAR + + OF COMING EVENTS

SHOWS

Philadelphia, Automobile	Jan. 10-17
Buffalo, N. Y., Automobile	Jan. 10-17
Newark, N. J., Automobile	Jan. 10-17
Milwaukee, Wis., Automobile	Jan. 10-18
Cincinnati, Automobile	Jan. 11-17
Baltimore, Automobile	Jan. 17-24
Boston, Automobile	Jan. 17-24
Hartford, Conn., Automobile	Jan. 16-24
Montreal, Automobile	Jan. 17-24
Detroit, Mich., Automobile	Jan. 17-24
Pittsburgh, Pa., Automobile	Jan. 17-24
Louisville, Automobile	Jan. 19-24
Omaha, Neb., Automobile	Jan. 19-24
Rochester, Automobile	Jan. 19-24
Amsterdam, Automobile	Jan. 23-Feb. 1
Washington, D. C., Automobile	Jan. 24-31
Chicago, National Automobile	Jan. 24-31
Cleveland, Ohio, Automobile	Jan. 24-31
Milan, Italy, Automobile	Jan. 24-31
Los Angeles, Calif., Automobile	Jan. 24-Feb. 1
Portland, Me., Automobile	Jan. 26-31
Springfield, Mass., Automobile	Jan. 26-31
Syracuse, N. Y., Automobile	Jan. 26-31
Wilkes-Barre, Pa., Automobile	Jan. 26-31
Lancaster, Pa., Automobile	Jan. 27-31
York, Pa., Automobile	Jan. 31-Feb. 7
Minneapolis, Minn., Automobile	Jan. 31-Feb. 7
St. Paul, Minn. (Joint show with Minneapolis)	Jan. 31-Feb. 7
San Francisco, Calif., Automobile	Feb. 1-8
Scranton, Pa., Automobile	Feb. 2-7
St. Louis, Mo., Automobile	Feb. 2-7
Copenhagen, Automobile	Feb. 8-15
Denver, Automobile	Feb. 9-14
St. Petersburg, Fla., Automobile	Feb. 9-14
Mankato, Minn., Automobile	Feb. 11-14
Peoria, Ill., Automobile	Feb. 11-15
Rapid City, S. D., Automobile	Feb. 12-16
Indianapolis, Ind., Automobile	Feb. 14-19
Providence, R. I., Automobile	Feb. 14-21
Sacramento, Automobile	Feb. 16-19
Berlin, Automobile	Feb. 19-March 1
Quebec, Automobile	Feb. 21-28
Des Moines, Automobile	Feb. 23-28
Seattle, Wash., Automobile	Feb. 24-Mar. 1
Camden, N. J., Automobile	Feb. 25-March 2
Geneva, Automobile	March 6-15
Altoona, Pa., Automobile	April 15-27
International Garage Exposition, Berlin, Germany	May 9-Aug. 9

CONVENTIONS

American Engineering Council Annual Meeting, Washington, D. C.	Jan. 15-17
Society of Automotive Engineers, Annual Meeting, Detroit	Jan. 19-23
Natl. Association of Engine & Boat Manufacturers, New York City,	Jan. 23
Natl. Paving Brick Mfg. Association, Pittsburgh, Pa.	Feb. 4-6
Midwest Power Conference and Exhibition, Chicago	Feb. 10-13
A. S. M. E. Fuels Meeting, Chicago,	Feb. 11-13
Society for Steel Treating (National Western Metal and Machinery Exposition), San Francisco	Feb. 16-20
Southern Automotive Jobbers Association, Atlanta	Feb. 19-21
Road Show and School, Wichita,	Feb. 24-27
American Chemical Society, Indianapolis, Ind.	March 30-April 4
Aeronautical Chamber of Commerce, Detroit	April 11-19
U. S. Chamber of Commerce, Atlantic City	April 28-May 1
International Chamber of Commerce, Washington, D. C.	May 4-9

SALONS

Los Angeles, Calif., Biltmore, Hotel,	Feb. 7-14
San Francisco, Calif., Palace Hotel,	Feb. 21-28

NOTE: Chicago Show Week Events are listed on page 77.

Mercer Name Appears On New \$2,500 Car

Production Will Take Place in Elcar Plant

MONTCLAIR, N. J., Jan. 6—Announcement of the formation of Mercer Motors Corp., a Delaware corporation, with headquarters in Elkhart, Ind., was made here Jan. 5 by Harry M. Wahl, president of the company. Mr. Wahl, who has been in the automobile business for the past 15 years, having been associated chiefly with General Motors interests, bought the Mercer name, designs, parts, etc., at the time production was suspended in the Trenton (N. J.) plant some years ago.

Associated with Mr. Wahl are Jules Howard, executive vice-president, who represents New York financial interests, and M. J. Graffis, chief engineer, formerly with Elcar. According to Mr. Howard, production will be started about March 1 in the plant of the Elcar Motor Car Co. in Elkhart, Ind. No general offering of stock is contemplated, Mr. Howard said.

Prices on the new cars, which will range from \$2,650 to \$4,000 for the eight body styles to be offered, are based on an estimated production of 3000 cars for 1931. According to an official of the company, a contract has been signed with Walter P. Street of Cleveland, Ohio, for 750 cars for export markets.

Auburn Line Priced

NEW YORK, Jan. 5—Prices on the 1931 Auburn line, described in *Automotive Industries* of Jan. 3, have been announced as follows:

Custom Line

2-door brougham	\$1,145
Sedan	1,195
Cabriolet	1,245
Phaeton sedan	1,345

Standard Line

2-door brougham	945
Sedan	995
Cabriolet	1,045
Phaeton sedan	1,145

Both free-wheeling and silent mesh synchronizing transmissions are embodied in the custom line, the standard line carrying the silent mesh transmission without free-wheeling.

De Soto Lines Priced

NEW YORK, Jan. 5—The following prices on the De Soto 1931 lines were announced by L. G. Peed, general sales manager:

	Six	Eight
Standard coupe	\$740	\$965
Sedan	775	995
Coupe with rumble seat	775	995
Roadster	795	995
Convertible coupe	825	1,075
De luxe sedan	not available	1,065

Sees Increased Traffic

BOSTON, Jan. 6—The year 1931 will be a period of greatly increased street and highway traffic. This is the opinion of Dr. Miller McClintock, director of the Albert Russel Erskine Bureau for Street Traffic Research.